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With the Author's respectful regards.

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PRESS MARK

COPLAND, J.

OF
PESTILENTIAL CHOLERA :

ITS
NATURE, PREVENTION,
AND
CURATIVE TREATMENT.

BY

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TO

DAVID BARRY, M.D.

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AND TO

WILLIAM RUSSELL, M.D.

Member of the Royal Medical Society of Edinaburgh, and Imperial Academy of Medicine and Surgery of St. Petersburg; and Commander of the Order of St. Anne of Russia;

TO WHOM THE MEDICAL PROFESSION, AND THE WHOLE
BRITISH NATION,

Are indebted for their zealous and scientific researches into the nature of the prevailing Pestilence during their Mission into Russia; and for the share they have had in the judicious and energetic measures recently adopted to meet its extension in this country,

THIS LITTLE WORK

IS INSCRIBED,

As an acknowledgment of the importance of their exertions for the public good,

BY THE AUTHOR.

*Bulstrode Street, Welbeck Street,
December 3, 1831.*

P R E F A C E.

CIRCUMSTANCES had induced the Author of this little publication to pay more than ordinary attention to the nature and progress of the pestilential cholera, from its irruption in Bengal to the present time. He had perused, with the utmost care, all that was published respecting it; and an opportunity had been afforded him of examining the reports and documents relating to it sent, from 1817 till 1827, by the Medical Boards and superintending surgeons of the three Indian Presidencies, to the Board of Directors of the East India Company. During these inquiries, as well as in conversations with several experienced practitioners who had left India, he was particularly struck by some important facts, respecting which he conceived that much misapprehension and error were entertained and widely disseminated, and which required refutation. The *first* of these is connected with the origin and nature of the distemper. Many supposed it to be the common spasmodic cholera of warm climates, in an epidemic form merely, an opinion still entertained by able writers, both in this country and on the continent. This opinion was, however, opposed to the Author's experience of the

forms of Cholera met with in warm and insalubrious countries, between which and the present pestilence there is a very marked distinction ; and it was contrary to the belief of the oldest European residents in India, and of the natives themselves, who might have been supposed to know something of the usual manifestations of cholera amongst them, unbiassed by preconceived notions, or by medical system and authority. Instead of looking upon it as an aggravated form of cholera, they regarded it, wherever it broke out, as an unheard of pestilence and scourge ; and at its appearance whole villages and towns were deserted in consternation, and with the view of escaping its infection ; whilst the greater part of the English practitioners, having been taught to consider cholera to consist of purging, vomiting, and spasms of the lower extremities, and finding these symptoms present in the distemper they were called to treat, believed it to be that disease merely, in an aggravated form, without taking into consideration much more important phenomena uniformly presented by it, and without sufficiently adverting to the fact that these symptoms are always slight, and often nearly altogether wanting in the most severe cases.

So strongly was the Author struck by this misapprehension, that in the beginning of 1822, when Editor of the Medical Repository, after noticing various facts connected with the disease, he observed :—‘ A careful
‘ review of the symptoms of this disease convinces us
‘ that the deranged actions which take place in the

‘ system during its continuance, are no more those to
‘ which the term cholera morbus ought to be applied,
‘ than they are those belonging to fever. It appears to
‘ us, that this malady is the result of the impression of
‘ some peculiar cause upon the system, which gives rise
‘ to a mode of action, greatly deranged, as well as
‘ diminished in degree, from that which is requisite to
‘ the healthy functions ; and that this peculiar cause im-
‘ presses the vital energies of the system in such a man-
‘ ner, as to subvert the power of reaction in many cases,
‘ and to render it imperfect and unavailing in others,
‘ without the assistance of art. The cause of the dis-
‘ ease seems to act in the manner of a poison on the
‘ extensive surface of the bronchiæ and air-cells, when
‘ the system is most liable to its attack ; and, in many
‘ instances, it appears to destroy its victim in the space
‘ of two or three hours.’—*London Medical Repository*,
vol. xvii. p. 407.

That the author’s opinion was neither prematurely advanced, nor inaccurate, has been shown by the subsequent researches of the most eminent observers. He had treated many cases of spasmodic cholera in a warm and most insalubrious climate, and had experienced the disease most severely in his own person ; and while he recognised in these cases the accurate description of PAISLEY, CURTIS, GIRDLESTONE, and of his talented and experienced friend Dr. JAMES JOHNSON, he never met with, in any of them, the pathognomonic symptoms of the prevailing pestilence. In this opinion he is borne

out by the experience and researches of Dr. BARRY, who has stated, since his arrival from St. Petersburg, and more recently from Sunderland, that the disease which he there investigated is altogether distinct from the severe forms of common cholera.

The *second* error, which has been extensively propagated both in this country and abroad, is, that the maldy never exhibited any proofs of infection in the East. Knowing, however, from the best sources of information, that this statement is croneous, the author has gone fully into the refutation of it, and has shown that much mischief has resulted from this opinion, and from the fact that, although evidence of its infection was everywhere furnished in India, no means of limiting the extension of the pestilence,—no sanitary measures were adopted in our Indian empire. That it should extend less rapidly there, and exhibit its infectious property in a less remarkable manner than in Europe, was to be expected from free ventilation, and other circumstances tending to diminish the chances of infection, particularly amongst Europeans in warm climates.

A *third* error very generally entertained, both on the appearance of the distemper, and in the present day, is, that it is an epidemic, and entirely owing to some unknown constitution of the air. But we have no instance on record of an epidemic of nearly fifteen years duration, without any interruption, unconnected with infection. Although the author admits that the pestilence is greatly aggravated by certain states of the air, to

which the term epidemic is strictly applicable, notwithstanding our ignorance of the precise nature of these states, yet there seems no doubt that it is propagated, and prevails to a certain extent, independently of an epidemic concurrent influence. We know that some diseases are simply infectious without being epidemic, that others are both infectious and epidemic, and others are epidemic, and only contingently infectious. But the author believes that, like eruptive and typhoid fevers, this distemper is infectious, is not essentially epidemic, although it will, during favourable states of the atmosphere, &c. assume epidemic characters, and be modified accordingly. An attentive review of the various manifestations of the malady in India, throughout Asia, and in Europe, seems to justify this view, and to confirm the conclusion as to its being a specific disease, arising from a specific cause, but promoted and disseminated more widely by the aid of various concurrent causes, amongst which epidemic, or unhealthy constitutions of the air; dirty, crowded, and close apartments; and crowding of the sick, are the most prominent.

As to the means of prevention recommended by the Author, he will merely remark, that he states them with the confidence which a long and a diversified experience inspires. The personal or prophylactic measures he has recommended were prescribed by him, in 1819, to a party of friends proceeding to Vera Cruz, the Havannah, and other places on the continent of South America, and in

the West Indies, where yellow fever is prevalent, and intending to reside there during the sickly seasons of these parts; and along with these were furnished instructions for treating the diseases they might be affected by. The persons to whom these instructions were given found them successful, having returned to this country without experiencing any disease, and requested his permission to publish them, which was granted. They were, several years since, reprinted from the work in which they originally appeared, and published, unknown to the Author, in a separate form, by a publisher in the Poultry, for those proceeding to unhealthy parts, and they have been since reproduced in various quarters without acknowledgment. The Author considers that this statement is due to himself, in order that he may not be accused of deriving opinions from those who were actually indebted to him for the information they furnished on this subject.

A considerable part of the treatment he has ventured to recommend has been, for many years, employed by the Author, in various states and forms of adynamic and malignant fevers, of inflammations, and of other diseases of an infectious and contaminating nature, similar or analogous in their nature to the prevailing pestilence, and with a success which has far surpassed his most sanguine expectation. He, therefore, confidently recommends a nearly similar treatment of this malady to the attention of the practitioner. The means to which he more particularly refers, are stated at para-

graphs 160-163, 168, 190-194. He may remark, respecting the success he has obtained from them, that, in similar or analogous states of disease to the prevailing distemper, where the mortality was from twelve to fourteen out of twenty, previously to the employment of these remedies, it has been reduced, in the Author's practice, to less than two in twenty. He should also add, that some of the observations contained in this work, were published in the sixteenth number of the *Foreign Quarterly Review*, and in the ninth volume of the *Medical Gazette*.

*Bulstrode Street, Cavendish Square,
December 3d, 1831.*

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PESTILENTIAL CHOLERA.

SECTION I.

DESCRIPTION OF PESTILENTIAL CHOLERA.

(1.) NUMEROUS attempts have been made by writers on the present destructive pestilence, to show that it is essentially the same disease with that form of cholera which has appeared at various times in warm climates. After the best attention I can give to the subject—from the history of the present malady furnished us by the very numerous authors who have closely observed its phenomena—and from an extensive experience of those varieties of cholera which occur in this country during warm seasons, and in the more unhealthy localities in intertropical countries, I am entirely convinced that the pestilence which has ravaged the East, and is gradually extending itself over Europe, is not only distinct from all visitations of the disease to which the name Cholera has been attached, and with which the history of medicine has made us acquainted, but is altogether a new disease, and one totally unknown to medical science previously to the year 1817, when it first made its direful irruption in Jessore, a populous and unhealthy city in the centre of the Delta of the Ganges.

(2.) That the *Mort de Chien*, or the severe form of cholera which was called *spasmodic* long before the present pestilence made its appearance, frequently occurs as a sporadic disease in many intertropical countries, and even rarely in temperate climates, after very hot and unhealthy seasons, must be well known to all who have enjoyed a sufficient range of medical observation; and that its frequency, as well, indeed, as the frequency of the bilious or common cholera, depends as much upon particular localities, seasons, and climates, and upon certain changes of the temperature and constitution of the atmosphere, as dysentery, bilious fever, or hepatitis; either being endemic, or assuming features approaching to epidemic, owing to those causes in conjunction with various circumstances proper to the inhabitants where it appears. When, therefore, the bilious and spasmodic forms of cholera assume characters approaching to those usually denominated epidemic, they will be traced to certain causes similar in kind to those now referred to, and will disappear as these causes cease to exist. But this distinctive character cannot be applied to the truly pestilential malady now desolating Europe. It has ravaged nearly all Asia, and a great part of Europe, during every grade of atmospheric temperature and humidity, in every vicissitude of weather and of season, and in every kind of locality.

(3.) According to the information furnished by Dr. PAISLEY, the cholera which prevailed at Madras in 1774 depended upon locality and peculiarity of season. The disease which M. SONNERAT mentions to have appeared, between the years 1774 and 1781, on the Coromandel coast, generally occurred after sleeping in

the open air, or from irregularities of diet. It was chiefly prevalent 'during the cold northerly winds of December, January, and February: when they ceased, the malady disappeared.' The accounts given of cholera in CURTIS'S well-known work, and in GIRDLSTONE'S Essay on the Spasmodic Affections of India, refer merely to a more than usual prevalence of the disease during the years 1781 and 1782, owing to the seasons, state of the climate, and circumstances connected with the individuals attacked by it. Mr. THOMPSON, who was deputed to inquire into the causes of the cholera which visited, in 1787, Arcot and Vellore, states that 'the disease is exactly the same as prevailed at Trincomalee in the months of April and May, 1782, when the season was very hot and chill, the winds blowing from the land and reaching some leagues to sea. The weather here, at present, is the same as I experienced at Trincomalee.'

(4.) But little information can be obtained respecting the appearance of cholera in a severe and epidemic form in Europe. ZACUTUS LUSITANUS (*Prax. Lib.*, ii., obs. 23,) states that cholera prevailed in Europe in 1600; but, from the meagre account he has given of its characters, I am in doubt whether it be a form of colic, or the spasmodic variety of the former malady. The cholera, which SYDENHAM has described as prevalent in the years 1669 and 1672, is clearly referrible to the *bilious* and *spasmodic* varieties of the disease, particularly the former in its most severe states.

(5.) Since the occurrence of the epidemic, noticed by Sydenham, other irruptions of cholera, evidently, however, of a very different kind from the pestilence now

under consideration, and referrible chiefly to one of the forms of disease now mentioned (§ 2-4), have been recorded to have occurred in various parts of Europe, but to have disappeared, in a short time, without producing any very remarkable mortality. Even the summer and autumn of the present year have furnished numerous cases of cholera, presenting either a predominance of the bilious or of the spasmodic character, according to the peculiar combination of predisposing and exciting causes, and the constitution and habit of body of those affected. This apparently has chiefly arisen from the occurrence of four years successively, in which nearly the double average quantity of rain has fallen, followed by a long, warm, and moist season. Yet still I will venture to say, that not a single case of cholera has occurred with the symptoms which characterize this disease, and which has been improperly called cholera.

(6.) But instead of referring to those circumstances connected with the origin of the common forms of cholera and the disease under consideration for grounds of distinction between them, let us look closely into, and at the same time analyze, the phenomena which characterize each during its progress, and we shall find proofs not of variety merely, but of generic difference. In truth the present pestilence, in all its most prominent features, has but little in common with any of the forms of cholera,—no more than it has with fever, plague, or dysentery. This, however, is not a new remark; it has been made by many of the experienced reporters to the Medical Boards of the three Indian Presidencies, and by the writer of this as far back as the beginning of 1822, as well as by several able authors. The appella-

tion of cholera is, therefore, not appropriate as respects the present pestilence. The misnomer would be a matter of but small importance, if, in the usual routine of medical practice, names were not things, or, at least, too frequently taken as such. This, however, is not the place to change further than the writer has done the appellation by which the present malady is now known, or to inquire as to what name would most accurately convey some idea of its nature and tendency, particularly as this topic will fall more appropriately under consideration in the sequel, after having described its phenomena, and considered them in relation to their causes on the one hand, and to their consequences on the other.

CHAPTER I.

Brief View of the Progress and Mortality of the Disease.

(7.) PESTILENTIAL cholera first made its appearance in Jessore, a populous town in the centre of the Delta of the Ganges, and cut off the majority of those whom it attacked. It spread from the town in all directions, and reached Jaulnah, on the Madras side of the Indian peninsula, in June 1818, and Bombay in August of the same year. It continued to spread and to prevail throughout all parts of India and the adjoining countries, and still prevails in many districts, although in various degrees of severity, and with intervals of complete immunity from its presence. Indeed, it may be said to have become naturalized in India, forming one of the diseases of the country.

(8.) During 1818 it visited, in an easterly direction, the Burmese empire, the kingdom of Arracan, and the peninsula of Malacca. In 1819 it appeared in the isle of Penang, in Sumatra, Singapore, the kingdom of Siam, Ceylon, and the isles of France and Bourbon. During 1820 it reached Tonquin, Cambogia, Cochin-China, Southern China, Canton, the Philippines, &c. In 1821 it visited Java, Bantam, Madura, Borneo, and numerous other places in the Indian Archipelago. In the years 1822, 1823, and 1824 it appeared at Tonquin, Pekin, Central and Northern China, the Moluecas, Amboyna, Macassar, Assam, and various other Eastern countries and islands. During 1827 it prevailed in Chinese Tartary. In all these countries and places its prevalence and fatality were unprecedented in medical history.

(9.) In July 1821, it reached, in its western course, Muscat in Arabia, and, during the remainder of the year, visited various places in the Persian Gulf. In the following month it appeared in Persia, and during 1822 and 1823, 1829 and 1830, it prevailed in several of the principal cities of that empire. It broke out in Busso-rah and Bagdad in July 1821, and in 1822 and 1823 ravaged most of the populous cities of Mesopotamia, Syria, and Judea.

(10.) In 1822 it reached to within 150 miles of the Georgian frontiers of Russia, and in 1823 appeared at Orenburg and Astrachan, beyond which it seems not to have extended until August 1828 and 1829, when it reappeared at Orenburg, the capital of the province of that name, situated on the Tartar frontier, about 400 miles north of the Caspian, and about 1000 miles north of the places where it prevailed extensively in 1822. Its

prevalence and fatality in this province were, upwards of a tenth of the inhabitants having been seized, and about a fourth part of those attacked having died of it. At the same time that the disease appeared in Orenburg, it was raging in several Persian provinces and Tartar tribes in Central Asia, from which it was supposed to have been introduced into Orenburg. At the commencement of 1830 the disease had entirely ceased in the Russian dominions; but, towards the beginning of autumn, it broke out with increased violence on the Georgian frontier of Persia, having appeared, in June, in the Persian province of Ghilan, on the southern shore of the Caspian, from the various southern ports of which it extended northwards along the westward Caspian shore until it reached Baku, Tiflis, Astrachan, and numerous other towns in its progress into the heart of the Russian empire. After attacking a number of places it has continued to spread westward and northward through Russia, Poland, Moldavia, and Austria; visiting Moscow, Warsaw, and other places in Poland, and extending, in May 1831, to Riga and Dantzic, and in June and July to St. Petersburg and Cronstadt; early in October to Berlin and Vienna, and subsequently to Hamburg, &c.

(11.) During the whole of its progress in 1830 and 1831, its fatality, and the rapidity with which a fatal termination occurred, have been unprecedented in the history of epidemics. In Tiflis, where it commenced in July 1830, it attacked, in ten days, nearly 600 persons, about one half of whom died. On the 17th of September it had seized 1792 of the Don Cossacks, and killed 1334. Besides various other places, it visited Penza, where

it appeared on the 17th of August, and in fourteen days attacked 1200 of the inhabitants, 500 of whom were carried off. In another town in this part of the Russian empire it seized on 1863 persons during the months of September and October, of whom fully one half died. At Kosan, during the end of September and beginning of October, it affected 1957 persons, and proved fatal to 1174 of them. About the middle of September it appeared in Moscow, and between this period and the 10th of November, 5451 of the population were seized, and 2876, or three-fifths, carried off.

(12.) It may be interesting to notice still further the *various degrees of prevalence and of mortality* which this pestilence has presented in different countries and cities. According to Moreau de Jonnés, one-tenth of the population of Hindostan was attacked, and one-sixth of those died. I should consider this estimate by far too low as respects the number attacked. The disease is even now prevalent in India, particularly in the countries under the Bengal government, although much less so than previously. In Arabia, one-third of the inhabitants, of the towns which it visited died of it. In Siam, Java, and the Mauritius, the number seized was extremely great, as well as the mortality from it. In China, its fatality was still greater, owing chiefly to the density of the population and the neglect of precautionary measures. In Persia, one-sixth of the inhabitants of several of the principal towns died of it. From one-fourth to one-third of the population of Mesopotamia was said to have perished. In Bussorah and Bagdad, situate in unhealthy localities and a humid atmosphere, a third of the inhabitants were

carried off by it in little more than a month. At Erivan and Tauris it destroyed about one-fifth of the population. But in more elevated and healthy situations it was much less fatal. In Syria its ravages have been extremely varied: in some places one-half of the inhabitants were swept away, whilst in others, as in Tripoli, only one perished out of every 200. During the prevalence of the pestilence in the southern and eastern provinces of Russia in 1830, the mortality was also various. At Tiflis three-fourths of the sick, at Astrachan two-thirds, were carried off. Out of 16,000 attacked in the province of the Caucasus, 10,000 died; at Moscow one-half, and at Orenberg one-fifth only perished. According to the author last quoted, out of 54,000 and upwards attacked in the provinces of Russia, in 1830, more than 31,000 died.

(13.) In Astrachan one-third of the cases were fatal; among the Don Cossacks two-thirds. At Moscow the mortality varied greatly; being at first so high as nine-tenths of the cases, and afterwards sinking gradually to a third. When the disease first appeared in India, the mortality was also extremely high; but its prevalence, as well as its severity and fatality, gradually abated after 1821. Exceptions, however, to this amelioration presented themselves in various places; and at the same period, when the rate of mortality did not rise above 8 or 10 per cent. in some parts, from one-fourth to two-thirds of the persons seized by it died in other places.

CHAPTER II.

Description of the Preliminary, the fully Developed, and of the Consecutive Symptoms of the Disease.

(14.) THE nature of this pestilence is best inferred from a faithful history of the phenomena manifested by it during its progress, and of the changes it produces in the organization, and from the means found successful in limiting its extension and in restoring the frame to its healthy state when subjected to its attack. In conducting the inquiry into the phenomena and nature of this pestilence, I will confine myself to the more important topics of the subject, and endeavour to arrive at inferences, which, I hope, may be productive of useful results.

Since the first irruption of the malady in the Delta of the Ganges, during its various manifestations in India, and other parts of Asia, and in its different visitations of northern and western countries,—whether observed in British India, in Siam, Java, and the adjoining islands,—in China, in Tartary, in Arabia, Persia, Syria, or in Russia, Prussia, Hungary, and Austria,—whether attacking the Hindoo, the Mussulman, the Malay, the Mongul, the Asiatic Caucassian, or the European branches of this race, the characteristic features of the disease have been uniformly the same,—modifications as respects grade, or intensity of attack, being the chief sources of distinction. Age, constitution, and varying

degrees of predisposition, frequently occasion different manifestations of certain functions, or peculiar forms of disturbance, yet still the principal phenomena continue but little modified excepting in degree; and it is not until consecutive changes are induced in the system by the morbid actions characterizing the disease, that any marked difference manifests itself,—such difference evidently proceeding from pre-existing states of the internal viscera, innate vigour of constitution, and the remedial means employed to remove the attack. This uniform character of the malady indicates the operation of a specific cause, with which, however, several others may combine, favouring its action, by disposing the frame to its invasion, by reinforcing its activity, or calling it into operation after the body has been exposed to its influence.

(15.) The specific cause producing the disease may be supposed not only to be thus reinforced by other causes, some of them of no mean influence, but itself may vary considerably in intensity, producing, *cæteris paribus*, effects of co-ordinate severity, yet still acting with a certain relation to the predisposition of the individuals exposed to it. This may be more clearly illustrated by taking for granted the operation of a certain infectious product, or poison, the existence of which will be shown in the sequel. This product or effluvium emanating from the bodies of those attacked with the disease, often in a form rendered manifest to the senses of the observer, necessarily varies as respects concentration and quantity, dilution in the air, and rapidity of dissipation by means of ventilation; its effects, therefore, may reasonably be supposed to vary equally in

grade, the state of predisposition to become affected by it being the same. Where, however, the predisposition is great, as after great fatigue, during mental depression, &c., a less concentrated and abundant effluvium proceeding from the body of the diseased will produce a more intense effect than this principle in its most active and concentrated form acting upon a person but slightly predisposed; whilst this intensity of cause will altogether fail of producing any marked effect in the strong, the unprepared, or the person whose moral confidence and equanimity generally repel the invasion of any form of infection.

(16.) Thus, therefore, the manifestations of the malady will be modified chiefly in grade, and scarcely at all as respects its form. In these respects the efficient cause of the disease is perfectly similar in its operation to the causes of other diseases familiarly known, and frequently observed in an epidemic form;—when concentrated and intense, the subject being also predisposed to its invasion, its effects are rapidly produced, remarkably severe, and speedily arrive at a termination. On the other hand, when weak or much diluted, or when the predisposition of the subject is slight, its operation is slow, and the train of morbid actions of longer duration, and diminished severity. Thus I have seen a person struck down nearly inanimate, by the infectious effluvium proceeding from the bodies of the sick, and concentrated in a close apartment, and death following in a few hours, without the energies of life being rallied; and similar results have been often observed in respect of the pestilential cholera. Owing, therefore, to the intensity of the efficient cause of the disease, to the num-

ber of concomitant causes which may reinforce its action, and to the state of predisposition of those exposed to them, the modified results which I am now about to detail will present themselves.

(17.) *A.* The *invading* or *preliminary symptoms* of the disease generally consist of pallor, and collapse of the countenance, with an expression of anxiety ; slight pain of the forehead, noise in the ears, and vertigo ; sickness, heat, and pain at the epigastrium ; oppression at the chest with frequent sighing ; nervous agitation, remarkable loss of muscular power, general uneasiness ; colicky pains in the abdomen, with slight diarrhoea, at first feculent, but afterwards watery ; sickness at stomach ; slight cramps of the legs ; oppressed, weak, small, slow or ereeping, and sometimes intermitting pulse, and coldness, clamminess, or humidity of the surface. These symptoms are of varied duration—sometimes of several hours, at other times not of as many minutes ; and, in some cases, they have been scarcely remarked, the patient having been struck down almost lifeless, with a dark or livid state of the surface, and all the symptoms characterizing the fully-formed state of the disease.

(18.) Dr. Smith observes, that several of those about to be attacked, may be seen with a peculiarly dark ring round their eyes ; and others state that the features evidently collapse, and the expression becomes anxious for a day or two, or at least for hours, before they sicken. At Orenburg, dyspeptic symptoms are stated to have preceded its attack, and a similar observation has been made in other places. Various authors have said, that stomach and bowel complaints, of a less serious nature, often preceded a fully developed seizure

for a day or two ; and that these complaints have likewise occurred in the place where this pestilence has prevailed, and been removed by treatment, or disappeared spontaneously, without being followed by the cholera.

(19.) *B.* The *fully-developed state* of the malady consists of great vertigo, nervous agitation, with complete loss of muscular energy ; cramps commencing at the fingers and toes, and rapidly extending to the trunk ; slow, thready, and weak pulse ; great collapse of the countenance, the eyes being sunk deep in their sockets and surrounded by a dark circle ; vomiting and purging of a fluid resembling whey, or rice-water, containing whitish flocculi ; a peculiar sharp and contracted state of the features, and wild and terrified expression of countenance arising from a feeling of rapidly approaching dissolution. The whole surface, particularly the hands, face, and extremities, assumes a leaden, blue, or purplish tint, varying in shade with the intensity of the attack and complexion of the person ; the extremities are shrunk, shrivelled, sodden, and the skin is deadly cold, damp, and raw to the touch ; the nails assume a bluish-white hue ; the pulse is either reduced to a minute thread, or is entirely lost at the wrist, and often can with difficulty be felt in the neck ; the course of the large superficial veins is marked by flat lines of a darker tint than the adjoining surface ; a burning heat and inexpressible anxiety is complained of at the epigastrium ; the patient tosses about incessantly, from a feeling of intolerable weight and anguish round his heart ; he struggles for breath, and often lays his hand on the stomach and chest, referring his agony chiefly to those situations ; his voice is nearly gone,

and his respiration is quick, irregular, most laborious, and imperfect; the inspiratory act being effected by an immense effort, and expiration being quick and convulsive. The patient calls frequently for cold water, speaks in a plaintive whisper, and utters only a word at a time, the lungs not containing air enough for a sentence. The tongue is always moist, often white and loaded, and generally flabby and cold. A thermometer introduced below the tongue indicates an animal temperature frequently of ten or twelve degrees below the standard of health. The sense of touch is generally greatly obscured, and deafness is often present. If blood be obtained in this state, it is black, flows by drops, is thick, and feels colder than natural; and the air which is expired is cold and raw. Vomiting and purging, which are far from being the most dangerous symptoms, and are often the most remarkable in the least urgent cases, are generally slight, or at least not profuse, in those attacks where the sinking of the vital energies are the most rapid and the greatest, or are readily allayed by medicine. The integuments of the abdomen are often raised into irregular folds, whilst the epigastrium and hypochondria, with the whole abdomen, are commonly, especially in the intensely severe cases, drawn inwards and upwards upon the chest. The spasms are generally of a more or less passive kind, but they sometimes, particularly in the loins, legs, and thighs, present a tetanic rigidity. They are often slight, or nearly absent, in some of the most rapidly fatal cases, or replaced by a constant tremor. There is occasionally a low whine of suffering expressed. The secretion of urine is totally suspended, as well as the biliary, the

salivary, and lachrymal fluids; and a peculiar earthy odour issues from the body, with a singular fetor of the perspiration and evacuations.

(20.) These are the symptoms in the more severe attacks, varying, however, somewhat in degree. If the remedial means succeed, the animal heat is slowly restored, the pulse becomes fuller, and the colour of the surface more natural; but if these means fail, rapid extinction of the functions takes place. Frictions even then may reduce the lividity of the part to which they are applied, but that of the face and hands increases. The lips and cheeks sometimes puff out in expiration as in apoplexy; and towards the close of the scene, the respiration often becomes slow, with a quivering of the tendons of the extremities. The mind is generally undisturbed, the patient feeling merely a certain degree of apathy towards the close, and a desire to be left to his fate. At last he is unable to swallow, he then becomes insensible, and he dies after one or two long convulsive sobs. In some cases, when the patient has been thus rapidly cut off, without any rallying of the energies of life, convulsive motions of the muscles have been remarked an hour or two, or even longer, after expiration had ceased.

(21.) Such is the history of the disease when it terminates life without any reaction of the nervous and muscular systems, the patient generally dying in from six to twenty-four hours. But, both in the East and in Europe, particularly the latter, or amongst Europeans resident in India, a consecutive state of disease, attended with efforts at reaction of an imperfect or malignant character, was not unfrequently observed. It was rarely

evinced in the weak Hindoo, or in the previously debilitated, of whatever race, but sometimes in the stronger or less predisposed in India, and often in Europe.

(22.) From the aggravated state which has been now described but very few recover, particularly if that state have existed as long as three or four hours before active treatment has been resorted to. 'A thread of pulse, however small, is almost always felt at the wrist, where recovery from this state is to be expected. Hiccough coming on in the intermediate moments between the threatening of death and the beginning of re-action, is a favourable sign, and generally announces the return of circulation. In less severe cases, the pulse is not wholly extinguished, though much reduced in volume: the respiration is less embarrassed; the oppression and anguish at the chest are not so overwhelming, although vomiting and purging and the cramps may have been more intense. The coldness and change of colour of the surface, the peculiar alteration of the voice, a greater or less degree of coldness of the tongue, the character of the liquids evacuated, are invariably well marked in all the degrees of violence of attack which we have hitherto witnessed in this epidemic. In no case or stage of this disease have we observed shivering; nor have we heard, after inquiry, of more than one case, in which this febrile symptom took place*.'

(23.) C. The *Consecutive Phenomena* of this malady vary considerably. In the East, when recovery took place from the previous state, it was often rapid and without much subsequent disease having been expe-

* Report from St. Petersburg, by Drs. BARRY and RUSSELL.

rieneed. The numerous writers, however, in the Reports from the Medical Boards of the three Indian presidencies make particular mention of a consecutive form of fever, characterized by nervous and malignant symptoms, such as we are about to enumerate, and which was very commonly observed to follow the attack at St. Petersburg. They also state that the malady often passed into visceral disease, and dysentery; and that the danger was not over, although they succeeded in rallying the powers of life. According to Drs. BARRY and RUSSELL,—

‘ After the blue or cold period has lasted from twelve to twenty-four, seldom to forty-eight hours or upwards, the pulse and external heat begin gradually to return; headache is complained of, with noise in the ears; the tongue becomes more loaded, redder at the tip and edges, and also drier. High-coloured urine is passed with pain and in small quantities; the pupil is often dilated, soreness is felt on pressure over the liver, stomach, and belly; in short, the patient is now labouring under a continued fever, not to be distinguished from ordinary fever.’

(24.) A profuse critical perspiration sometimes comes on from the second or third day, and leaves the patient convalescent; but more frequently the quickness of pulse and heat of skin continue; the tongue becomes brown and parched; the eyes suffused and drowsy, with a dull flush, stupor, and heaviness of the countenance, resembling typhus. Dark sordes collect about the teeth and lips; and sometimes the patient is pale, squalid, and low, with the pulse and heat below natural, but with the typhous stupor. Delirium generally supervenes, and death takes place from the fourth to the eighth day, or

even later, in the very person, too, whom the most assiduous exertions had barely saved in the cold stage. Dr. REIMER states, that of twenty cases treated under his own eye, who fell victims to the disease, seven died in the cold stage, and thirteen in the consecutive fever. Drs. BARRY and RUSSELL add, that persons employed about cases in this typhoid stage, are never attacked with ordinary fever, but with a genuine cold, blue cholera.

(25.) In another class of cases, serious disorders of the secreting organs of the abdomen, particularly of the liver and of the digestive tube, supervene, instead of the low nervous fever now described. The evacuations from the bowels become of a dark, blackish, offensive, and highly irritating kind, and attended frequently with discharges of a bloody fluid, with mucus, and extremely urgent irritation of the rectum, the consecutive symptoms assuming nearly the character of dysentery. Sometimes an inflammatory, or sub-inflammatory state of the stomach and bowels takes place, either alone, or accompanied with great tenderness in the region of the liver, and disorder of the biliary secretion. In other cases these symptoms assume very nearly the form of bilious or gastric fever; and in a few this state of disease is associated with inflammatory irritation of the lungs. When these states of consecutive disease are severe, they not seldom carry off the patient; and where recovery takes place, are frequently accompanied with tedious convalescence.

(26.) *D.* The *points of difference* between the manifestations of this pestilence in India, and in the north of Europe, appear to be chiefly the following:—1st. The

evacuations seem to have been more profuse and unmanageable in the former than in the latter, although the characters of the evacuations were entirely the same. 2d. Restoration to health from the cold state, without passing through consecutive fever, was by far more frequent in India than in Europe, nor did the consecutive fever there so generally assume a typhoid type. 3d. The proportion of deaths in the cold, compared with those in the consecutive stage, was far greater in the latter than in the former country; and 4th, The proportion of medical men and hospital attendants attacked seemed greater in St. Petersburg than in the East. Relapses, also, in the hospital attendants were not unfrequent; whilst convalescence was generally perfect and rapid elsewhere. Mr. JAMESON states, in the Calcutta Reports, that, although relapses were not uncommon, there seemed to exist an immunity from second attacks.

(27.) It may, perhaps, be difficult to explain the modified state of consecutive disease now described. Much, perhaps, may be owing to the state of predisposition, the intensity of the cause, and the constitution of the affected: something also may be attributed to the effect of treatment in the early stage of the malady, particularly the more general employment of blood-letting and large doses of calomel,—means evidently calculated to remove the oppressive congestion of the vital organs, and re-animate the functions of the secreting organs and emunctories of the frame, but which seemed not to have been so generally, nor so decidedly, resorted to in Russia and Poland as in India.

CHAPTER III.

The Prognostic Symptoms of the Disease.

(28.) THOSE symptoms which indicate a *favourable* termination of the disease are, increase of the firmness and fulness of the pulse; returning animal heat to the surface; a tonic character of the spasms, or active retchings; not very urgent feelings of heat and anxiety at the epigastrium and præcordia, or a diminution of these symptoms, and of the pressing desire for drink; the occurrence of hiccough; a more natural and a livelier state of the countenance and surface of the body; greater freedom of respiration, and a diminution of the rawness and coldness of the respired air; a free evacuation of the bowels, with the appearance of a return of the biliary secretion, and especially the evacuation of urine, and amelioration of the tremors, restlessness, and general distress. These generally indicate a decrease of danger in the early stage of the disease, and returning vascular reaction; but this state may proceed to a fatal issue with all the symptoms of congestive and adynamic continued fever.

(29.) Typhoid symptoms, such as low delirium, black sordes on the teeth and lips, dry, parched skin, &c., may come on, and the patient sink. The non-accession of these symptoms; the occurrence of a copious, warm perspiration; the return of the natural secretions and evacuations,—as of the salivary, bilious, and urinary secretions; the absence of serious affections of

any of the viscera contained in the abdomen, particularly of the liver, stomach, and bowels; and a return of the functions of the nervous, assimilating, circulating, and respiratory organs to their natural state, are the chief guides of the physician in forming a favourable prognosis.

(30.) On the other hand, an *unfavourable* issue must be looked for when the prostration of strength; the coldness and blueness of the surface; the sinking and irregularity of the heart's action; the collapse of the countenance; the coldness and rawness of the expired air; the oppression and difficulty of respiration; the anxiety and restlessness, &c., are great or, individually, extreme; and especially if, with great intensity of these phenomena, the retchings and spasms are slight; or the latter consist chiefly of tremors, or irregular clonic contractions. An oozing from the mouth of the fluids from the stomach, unconscious evacuations or relaxation of the sphincters, the breathing consisting of convulsive sobs or being stertorous, with puffing of the cheeks or lips, and inability to swallow, indicate approaching dissolution in the cold or early period of the disease.

(31.) The occurrence of low delirium, or of coma, with collapse of the countenance, and all the symptoms of malignant continued fever, consecutive of the cold stage, are extremely unfavourable, especially when attended with great stupor, dark sordes, convulsive tremors of the tendons, and restlessness. These symptoms show that the congestion of the nervous centres, which occurred in the preceding periods of the disease, together with the morbid state of the blood itself, has been followed by serious disturbance of the capillary circulation in the substance of the brain and of its membranes,

probably conjoined either with effusion beneath or between the arachnoid membrane, or with continued congestion of the veins and sinuses of the encephalon.

(32.) The supervention also of tenderness, pain, &c. in the region of the liver, or in that of the stomach; a very morbid and irritating state of the alvine evacuations, with blackish, bloody, and mucous discharges, attended with tremors, &c., all indicate, respectively, the consecutive appearance of inflammation, or inflammatory congestion of the liver, of the stomach, and bowels (§ 35) evince a marked tendency to disorganization, and call upon the practitioner for the employment of the most decided means of cure. Although these consecutive phenomena show a most serious state of disease, yet recovery will not unfrequently take place from it by the assistance of well directed means.

CHAPTER IV.

Of the Morbid Appearances observed after Death from Pestilential Cholera.

(33.) THE morbid changes observed after death from this pestilence are in every respect the same, both in Eastern and in European countries. When the cold stage proves fatal, or death takes place within four-and-twenty hours from the seizure, but little change of organization can be detected, although the viscera are much altered in *appearance* from the healthy state. The surface of the body usually presents the same aspect as mentioned when describing the fully formed stage of the malady, being livid, corrugated, constricted, and humid

The lungs are commonly found collapsed, condensed, sometimes remarkably shrunk, and always loaded with black blood, of an oily or ropy consistence, and very closely resembling tar. The cavities of the heart are filled with a black blood, and they frequently contain polypous coneretions. Blood of a similar appearance is generally found in the arch of the aorta and other large arteries. The blood-vessels of the brain and its membranes are more or less gorged with dark blood, particularly towards its base. The arachnoid membrane is frequently deprived of its transparency. A serous fluid of various quantity is often found effused between the convolutions of the brain, and in the lateral ventricles. Similar appearances to those detected in the eranium are also found in the vertebral column.

The abdomen, upon being opened, generally emits a peculiar offensive odour. The stomach and different parts of the bowels are frequently partially, but considerably contracted; at other places greatly distended with flatus: the internal surface of the stomach sometimes seems but little affected. A whitish or yellow fluid matter, resembling the evacuations, is often observed in different parts of the alimentary canal, which occasionally contain much air, but neither bile nor fæces. The internal surface of the intestines is commonly lined by a tenacious muco-albuminous matter. The colon is frequently much contracted, generally throughout. The mucous membrane and sub-mucous-cellular tissue of the digestive canal present evident marks of congestion, in some cases approaching to a sub-inflammatory state, but generally in spots or patches of various sizes, the colour of these varying from a very dark venous con-

gestion, to a more roseate hue. Decided signs of inflammation are always wanting, even in the most remarkable of those congested states. Both stomach and bowels are frequently of a paler colour than natural, both in their inner and outer surfaces. The liver is generally pretty full of dark-coloured blood: the gall-bladder often much distended with tenacious ropy bile, of a dark yellow or green colour. The gall-ducts are sometimes contracted, at other times not. The appearance of the pancreas, spleen, and kidneys, is various, frequently differing but little from their natural state, in other cases somewhat gorged with blood. The urinary bladder is always contracted and empty. The vena porta and all the large abdominal veins are loaded with black blood, resembling tar in appearance.

(34.) In cases, the duration of which extends from one to three days, the same leading appearances as now described are observed, but often with considerable addition. The vessels of the stomach in these are found loaded with blood, presenting a surface sometimes of a pale pink hue, sometimes of a deep blue, at others of so dark a tint as to resemble sphacelus of the membrane, from which, however, it was readily distinguished by the firmness of the texture. Similar changes are found in the small intestines, and but very rarely in the larger. In those cases in which coma occurs serum is sometimes effused in larger quantities than already alluded to, but occasionally congestion only of a very black fluid or semi-fluid blood is found. Those who die of the consecutive disease show few appearances that are different from such as are usually observed in other cases, attended with corresponding symptoms.

(35.) These, however, chiefly consist in the cases which evince marked disturbance of the cerebral organs; of greater vascularity of the substance of the brain and of the membranes than natural, with the congestion of blood in the veins and sinuses, and effusion into the ventricles and between the membranes, particularly between the pia mater and the arachnoid reflected over it. In some cases the brain seems dusky or mottled, and the veins turgid with dark semi-fluid blood. In those terminating fatally with hepatic disturbances, the liver is generally of a dark brownish or sodden appearance. In some cases it is of a purplish black, somewhat enlarged, its veins filled with dark semi-fluid blood, and the ramifications of the hepatic duct loaded with a dark green or greenish yellow bile. The stomach and bowels, particularly the latter, are contracted and thickened, the inner surface softened, of a dark red or purplish colour in patches or streaks; sometimes excoriated, partially detached from the muscular coat, and covered with a muco-sanguineous fluid, in those who have died with consecutive gastro-enteric or dysenteric symptoms.

SECTION II.

OF THE CAUSES AND NATURE OF PESTILENTIAL CHOLERA.

(36.) THERE are few subjects which have given rise to greater diversity of opinion, or to more discussion, than the causes of this disease. Suppositions have been adduced, and reasoned from, as established and admitted facts; and repeatedly observed occurrences and corroborated evidence have been explained away or denied, even by those who have given us merely vague hypotheses and chimerical speculations in their place. It must be evident that but little, truly important, can be stated in respect of the causes and nature of this malady, without previously inquiring into, and coming to some conclusion as to its infectious *or* non-infectious nature. I shall, therefore, inquire, in the *first* place, into the evidence which has been adduced in favour of its possessing an infectious property, and as to the extent and character of this property. Its predisposing and concomitant causes will *next* come under consideration; and, *lastly*, various topics connected with its nature will be discussed.

CHAPTER I.

The infectious Nature of Pestilential Cholera demonstrated.

(37.) THE infectious or non-infectious nature of this disease is one of the most important topics to which

public attention can be directed ; and one which, owing to the manner of viewing it, adopted both in this country and on the Continent, requires the serious consideration of the informed part of the community. Knowing that much important information had been furnished by the medical observers of the disease in India, which was either entirely overlooked, or wilfully neglected, I made it my business to examine carefully the mass of reports to the Medical Boards of the three Indian Presidencies, and there printed, and to which access can scarcely be obtained in this country, from their extreme scarcity. I had also an opportunity of referring to the medical reports at the India House. From those sources, therefore, and from others within my reach, I can state that much misapprehension of this terrible disease has gone abroad, and been propagated by authorities that should have been more accurately informed on the subject. I can truly sta' that, although my attention has been much engaged by this disease, since the time of its eruption in the Delta of the Ganges, I approached this topic with my mind entirely unbiassed, and desirous of adopting that view of it, which well-ascertained facts should most fully support. When, therefore, I perceive the first professional authorities stating opinions which have misled, and will still further mislead, those who have it not in their power to detect their unsound basis, it becomes the duty of those who have detected their unsoundness to place the particulars within the reach of the misinformed. One able writer remarks as an acknowledged and proved fact, ' that by an overwhelming majority of the British medical officers, who ' have witnessed epidemic cholera in the East Indies,

‘ this disease is not considered to be of a contagious or
‘ infectious nature. A few incidents occurred which ex-
‘ cited suspicions in the observers, that it might really,
‘ after all, possess this property. But scarcely a single
‘ person has advocated the doctrine of contagion with
‘ any earnestness.’ The same writer afterwards stated,
that ‘ the almost unanimous and earnest recommenda-
‘ tion of British practitioners was not to consider the
‘ cholera contagious.’ In another country an eminent
physician, in an elaborate memoir on the disease, read
very recently before the ‘ Académie Royale de Médecine’
of Paris, states, as a well-ascertained matter, ‘ that in
‘ India the medical men and attendants on the sick were
‘ not more frequently seized by the disease than others
‘ of the community.’ Other instances of gross mis-
statement, made both by foreign and British writers,
may be adduced, but these will suffice. Now, when we
turn to the great authorities on the subject—to the
official depositories of the origin and rise of this pesti-
lence, we find that all the reports—the Bombay, the
Madras, and the Calcutta, favour the infectious nature
of the disease more or less. It is true that a majority
of the surgeons and assistant-surgeons in India, who
sent reports to their respective Medical Boards, state
that they do not believe the disease infectious; but a
large number of them give a very different opinion,
whilst the reasons assigned by many for believing the
disease to result from other causes than infection, are
actually favourable to the existence of an infectious pro-
perty. Even where they have argued against its infec-
tious nature, they have often adduced the strongest evi-
dence, although unconsciously, of its possessing this
property.

(38.) When I entered upon the present inquiry, and commenced with the Reports from the three Presidencies, in the order of their appearance, I had not completely made up my mind on the subject of infection, as respects the manifestation of the disease in India. But in order to come to a just conclusion, I had recourse to the earliest and the best information, and read and noted every individual report which these bulky publications contained: and so far are the remarks above quoted wide of the truth—so far are the medical men of India nearly unanimously against the belief in cholera possessing an infectious property, that the members of the Medical Board of Bombay, in the preface to the Reports sent to them, and published at Bombay in 1819, state, that the disease had extended from Poonah to Panwell, a considerable village in the main line of communication between Poonah and Bombay; that a man who had left Panwell and arrived at Bombay, a distance of about fifteen miles, was soon afterwards attacked by the disease, and communicated it to those attending him; that it was traced in parts adjoining Bombay, and on the Island, from village to village, by the arrival of persons affected with it from places where it was known to prevail; and that there were places which, from want of this sort of communication, had, up to the time of the report, entirely escaped. From the foregoing and other data, the members of the Bombay Board—the first to furnish information respecting the disease—conclude that ‘ it appears to them incontrovertible that this disease is ‘ capable of being transported from one place to another, ‘ as in cases of ordinary contagion or infection, and also ‘ to possess the power of propagating itself by the same

‘ means that acknowledged contagions do, that is, by
 ‘ the acquisition of fresh materials with which to assimilate.’ *

(39.) In the same Reports we find Captain SYKES stating that he ascertained that the disease did not break out in any village ‘ until that village had communication ‘ with a neighbouring place in which the disease existed ;’ and he furnishes several instances proving this fact. Besides, he states that the attendants on those first seized in his company were attacked, and that it spread from one of his servants to five, whilst the gentlemen in the next tent had not one affected ; and he remarks that he could add similar instances to those now adduced. (p. 118.) Mr. COATS, surgeon, in a letter to the President of the Bombay Medical Board, states, that the idea most prevalent was, that the disease was brought from Jaulna to Aurungabad, and that its progress could be traced distinctly through the villages on the chief road from Nagpore to those places. (p. 145.) He afterwards states, that the information as to the extension of the disease by infection was not only furnished by Europeans, but that some Brahmins had given similar information, without any particular inquiry on the subject having been made of them. From these and other facts, he concludes by considering the disease infectious ; and that, ‘ if it was occasioned merely by a distempered state ‘ of the air, it would have spread over the country with ‘ some regularity, but the epidemic seems generally to ‘ have travelled in lines along the post roads, and always ‘ to have required a succession of subjects for its propa-

* Bombay Reports, pp. 10, 11, &c.

‘gation. In Candeish, where there is not sufficient population and but little intercourse between the villages, its progress was slow. At Pundergoor it made its appearance at the time of the great Jatra, and was spread at once in all directions by the pilgrims returning to their homes.’—(pp. 150, 151.)

(40.) Dr. JUKES, in his able Report to the Board, states, that the disease travelled along the high road from the Deckan to Panwell, and that he has not heard of any village in the Conkan that has had the disease, but by intercourse with places in which it had been already prevalent. ‘If it be something general in the atmosphere,’ he remarks, ‘why has it not hitherto made its appearance in some two distant places of the province at the same time? Nothing of this kind has, I believe, been observed: it still seems to be creeping from village to village, rages for a few days, and then begins to decline.’—(p. 173.)

(41.) Dr. TAYLOR reports that ‘whenever the disorder appeared in any particular spot or family, a considerable proportion of the family or neighbours were attacked within a very short period of each other: on many occasions I have seen three or four of a family lying sick at once.’—(p. 195.) Dr. BURRELL informs us that in the short space of six days every attendant, in his hospital, on the patients affected with cholera had the disease.—(*Bombay Report*, p. 9.) And Mr. CRAW states, that every one of the attendants, thirty in number, in the hospital of the 65th regiment, were attacked.

(42.) The next Report which issued from India was edited by Mr. JAMESON, and was published at Calcutta in 1820. This gentleman, whilst he reasons in an ex-

tremely loose manner against the existence of an infectious property having been evinced by the disease, and without furnishing proofs of its absence, actually adduces evidence of the action of what he is endeavouring to disprove. Thus, where he is stating in general terms, and without any reference to reports from the different medical officers in the establishment, that the disease did not seem to be more prevalent in the tents or hospitals of the divisions of the army, in which the sick were treated, he communicates the following important fact in a note. 'A Sepoy died of the pestilence. Five of the corps, who had shown no signs of illness, were employed to carry the body to the grave. They were all seized with the disorder during the ensuing night, and all died.'—(p. 130.) Mr. JAMESON, instead of appearing as the editor, or publishing reporter, of the opinions sent to the Calcutta Board, states his own views, endeavours to explain away those which are different from them; and thus the publication, which in the title-page professes to be a Report, conveys not a single line of information from any one on the Bengal establishment, excepting this writer himself. The work, therefore, cannot be looked upon as furnishing the opinions of the majority of medical men in this part of India, inasmuch as we find no authorities or opinions contained in it but those of Mr. JAMESON himself; and these are evidently so perfectly at variance with one another, and with the ascertained laws by which those diseases, which are familiarly recognised as infectious, are governed, that we cannot, even although we receive some of the facts which he adduces, consider him as an authority on this subject. In all his remarks he seems to suppose that contact is requisite to the pro-

pagation of contagious diseases, and that because some persons in contact with the sick so frequently escape, the cholera is not contagious. He overlooks the influence of predisposition, which is so remarkably influential in all maladies which perpetuate themselves; and he entirely forgets the operation of those causes which often come in aid of the poison or effluvium exhaled from the bodies of the diseased, even after the exposure of a healthy person to it, and which frequently determine its action or call it into operation, when, without such reinforcement, it may have failed in producing its specific and deleterious effects. Notwithstanding those misapprehensions, and the evident bias which the whole work betrays in favour of pestilential cholera being non-infectious, numerous facts escape him, eminently calculated to support the opposite doctrine. Thus he informs us that the Medical Staff present with the Hansi force was '*persuaded*' that the infection was extended to it from the Meerut detachment, which caught the disease on passing through Delhi, where it prevailed. And at another place he informs us, that the centre division of the Bengal army were infected by a detachment which joined it whilst subjected to cholera. He endeavours, however, to explain away this occurrence; but it is evidently shown, and even admitted by himself, that the pestilence was introduced into this division, either by this detachment, or by some of the Rajah of Sumpter's troops, which were affected, and mixed with some regiments of the division.

(43.) After proceeding through a number of pages, in which Mr. Jameson reasons against the infectious nature of the disease, what was my surprise when I found him, towards the conclusion of his observations

on the subject, express himself in the following manner:—‘ This much, however, may be affirmed, from a review of the whole progress of the epidemic in this quarter, that the infectious medium, in whatever it consisted, was confined within a very circumscribed circle, and was very slowly extended to healthy parts of the atmosphere. If, setting aside the circumstances militating against it, we take it for granted that the infection was truly received by the centre and Hansi divisions from the detachments above mentioned, we must believe that the disorder, although not communicable by contact from person to person, was so from one large body to another large body; and that whenever the poison got head amongst a number of men, it assumed some new quality, so as, when mixed with the atmosphere, to become infectious. What constituted this additional quality, we cannot pretend to determine; but in support of its existence, we may quote the predilection of the epidemic for cities and camps; the infection of the left division, and the Nagpore and Meerut troops, immediately after entering into the diseased medium at Jubbulpore, Nagpore, and Delhi; and the similar case of the troops and followers in attendance upon the Governor-General being attacked shortly after communicating with an infected village in the Gorruckpore district. To the same account may be placed the progressive march of the disorder from one part of an infected place to another, as in the centre and Hansi divisions, and more particularly the Rajpootana force, in which the virus seemed to be regularly propagated from corps to corps. In some instances, the suffering body would appear to have sickened im-

‘mediately upon coming into the poisonous medium, as
 ‘was the case with the Nagpore troops, who were affected
 ‘on the very day in which they encamped at the infected
 ‘village of Gaongong; but more frequently one or two
 ‘days would seem to have been requisite to bring the
 ‘virus into action. Thus the Meerut detachment entered
 ‘Delhi on the 29th, and was not affected till the 31st;
 ‘thus, too, the Hansi troops had not the disease till the
 ‘6th, the day after the junction of that detachment.
 ‘Again, by those abetting the opinion of the disorder
 ‘being communicated to the centre division by the
 ‘Shergur detachment, it is stated that the first cases
 ‘occurred on the 11th, two days after its junction.
 ‘Lastly, the followers of the troops in personal attend-
 ‘ance on the Governor-General in April first suffered
 ‘on the 23rd, three days after encamping near the in-
 ‘fected village.’—pp. 144—146. This author after-
 wards adds, that the disease recently appeared in a de-
 tachment of the Rajpootana force under such circum-
 stances as at first seemed to warrant a suspicion of the
 existence of contagion.

(44.) The foregoing quotation will be found to differ but little from the conclusions which an attentive consideration of the subject has led me to adopt, and which I will give in the sequel. I have thought it right to be thus particular in the investigation of this subject, because, upon the adoption of correct ideas respecting it, will mainly depend the employment of successful measures to circumscribe, entirely to prevent, or counteract the disease. And I hesitate not to maintain, that, owing to the very loose manner in which this subject has been considered, and to the neglect of means which the due

interpretation of the information furnished even by the most sceptical as to the existence of infection, amongst the reporters to the India Medical Boards, ought to have led, are to be imputed, in no small degree, the extension of the disease not only throughout India, but its propagation also to other parts of Asia and to Europe. I have thought it most advisable to go to the original sources for information as to this and various other topics, because the opinions of the Indian reporters were generally derived from an extensive and varied experience of the disease during a number of years, and they were not certainly previously biassed in favour of contagion, that being a property which the diseases of India seldom present. Whilst also the information, which these able and most zealous men furnished us with, was of a superior description to that which has appeared elsewhere, the impossibility of obtaining it in this country—particularly the reports, the most valuable part of it—has induced me to refer to them in preference to other authorities. Having shown the identity of the Indian with the European epidemic, the arguments derived from facts observed in the one are equally applicable to both; and therefore I pursue the present topic, and further demonstrate, from the most valuable and voluminous reports published by the Madras government, the inaccuracy of the views which have gone abroad respecting our experience of the disease in India, and which have vitiated the doctrines and paralyzed many of the measures, both preventive and curative, which have been adopted in Europe.

(45.) Mr. SCOTT, the editor of the numerous and able reports which were transmitted to the Madras Medical

Board, and were published at length at that presidency, has given an able summary of the evidence which was furnished him, in conjunction with the results of his own observation. The value of the information here conveyed, its accordance with the most accurately observed facts connected with the manifestation of the disease in Europe, and the difficulty of access to the original, will be a sufficient apology for the length of the following quotation:—‘ Bodies of troops in motion have been
‘ attacked, and have retained the disease, while it was
‘ unknown to the fixed inhabitants of the country through
‘ which they passed. One of two corps in a camp has
‘ been attacked, and the other has escaped the disease.
‘ Ships arriving from other parts of the world have never
‘ suffered under the assumed epidemic constitution of the
‘ atmosphere before reaching the shore. * * * * Dis-
‘ eases avowedly infectious, such as small-pox, measles,
‘ &c., have not at all times the power of spreading epi-
‘ demically: for while it is certain that their exciting
‘ causes are never wholly extinct, it is only at particular
‘ periods that these diseases become epidemic; but we
‘ are unacquainted with the circumstances under which
‘ this power of epidemic propagation arises. The same
‘ may be the case with cholera. All the atmospheric
‘ phenomena, and other circumstances brought under
‘ the head of occasional causes, have, with little or no
‘ interruption, existed from the beginning of time until
‘ now, without producing cholera — consequently the
‘ super-addition of a new cause must be inferred. An
‘ European, proceeding on his journey to Trichinopoly,
‘ on the 15th October, was taken ill about a mile from
‘ the Mount, brought back to the house where he had

‘ passed the day, and there died. On the 17th the wife of
‘ that person, on the 19th the owner of the house, and
‘ on the 21st his wife, all experienced attacks of cholera,
‘ but recovered. Several of the native servants also
‘ suffered. The instances of the disease appearing at
‘ places immediately after the arrival of corps and de-
‘ tachments which were suffering from it are very
‘ numerous. For example, it appeared at Jaulnah im-
‘ mediately after the junction of a party from Nagpore,
‘ amongst whom it prevailed. It appeared at Aurunga-
‘ bad, and at Malligaum in Kandeish, after the arrival
‘ of parties who had left Jaulnah at the time the disease
‘ was prevalent there, and amongst whom it had broken
‘ out on the march to these places. It appeared a second
‘ time at Malligaum, after the junction of the 1st bat-
‘ talion of the 5th regiment, in which cholera prevailed.
‘ It appeared at Secundrabad after the arrival of a de-
‘ tachment suffering from it, and it appeared afterwards
‘ in the villages through which the detachment had
‘ moved. It appeared at Gooty, where no case had been
‘ observed for six months before, immediately after the
‘ arrival of the 1st battalion of the 16th regiment of foot,
‘ in which it prevailed with great mortality. It is re-
‘ markable that the same formidable type of the disease
‘ which prevailed in the marching corps was communi-
‘ cated to the corps at Gooty. It also spread on that
‘ occasion to the adjacent villages. It also appeared in
‘ a detachment of artillery, previously perfectly healthy,
‘ upon their encamping on the ground which had been
‘ immediately before vacated by the 1st battalion of the
‘ 8th regiment, in which corps the disease prevailed.
‘ The bodies of several persons who had died of cholera

‘ remained exposed on the ground when it was taken up
 ‘ by the artillery. The prisoners in a gaol, enclosed by
 ‘ a high wall, have escaped cholera, while it prevailed
 ‘ all around them; and the inhabitants of certain hilly
 ‘ ranges have also escaped the disease. These have been
 ‘ said to have interdicted all intercourse with the people
 ‘ below. When cholera is once established in a march-
 ‘ ing regiment, it continues its course in spite of change
 ‘ of position, food, or other circumstances. Its approach
 ‘ to a town has been traced from village to village, and
 ‘ its first appearance in a town has been in that quarter
 ‘ which was nearest the track of its progress. The sud-
 ‘ den appearance and disappearance of cholera, however
 ‘ unlike the progress of known infectious diseases, is not
 ‘ admitted as being irreconcilable with the doctrine of
 ‘ infection, especially if the disease be of sudden invasion
 ‘ after the application of the exciting cause. The rela-
 ‘ tions who have attended on people ill of cholera, as
 ‘ well as the nurses appointed in military corps for that
 ‘ duty, and in general those whose employment has led
 ‘ them to be much with the sick, have been observed, in
 ‘ very many instances, to be attacked with cholera dur-
 ‘ ing, or shortly after, their attendance. The sick in
 ‘ hospitals labouring under other diseases have likewise
 ‘ been observed to be attacked with cholera, especially
 ‘ those who lay near the patients ill with that disease.
 ‘ Sometimes whole families have been swept off succes-
 ‘ sively. Servants have often been observed to sicken
 ‘ after attending their masters.’—p. xlvi. *et seq.*

(46.) This, however, is only a portion of the facts and circumstances advanced by Mr. Scott in proof of the infectious nature of this pestilence. In addition to

the foregoing, I may add the opinion of several able and experienced surgeons and physicians, contained in their reports to the Madras Government:—Superintending Surgeon DUNCAN states, that ‘the 34th regiment carried ‘the pestilence with them from Bellary to Nundydroog, ‘and there was no trace of the disease in any village on ‘the road. Since the regiment passed, every village on ‘the road has been attacked by cholera.’—(*Madras Rep.* p. 111.) Mr. TRAIN adds, that ‘the attacks have shown ‘a great disposition to run in families, and even among ‘the attendants on the sick; and have in such cases ‘been much more severe than usual.’—p. 131. Mr. ENGLAND observes in his report, which evinces great experience of the disease, and extensive information, that ‘the disease has been greatly felt amongst the ‘attendants on the epidemic patients at various places; ‘consequently those occurrences, together with the pro- ‘gressive extension of the disease over a great extent of ‘country, tend to establish its contagious principle.’—p. 170. This gentleman proceeds to notice the extension of the disease from troops and travellers to places on the roads through which they had passed, and other facts similar to those already recorded in proof of its infectious nature.

(47.) Mr. CHAPMAN, after stating facts perfectly in accordance with those furnished by the reporters already quoted, adds, that he feels most confident of having experienced the attack of the disease, under which he had with difficulty recovered, from infection. Being anxious about a patient, he remained with him for several hours, watching the progress of the disease. He felt nausea on quitting him, but attributed it to the peculiar factor

evolved from the evacuations. On the following morning he was attacked with cholera, which nearly proved fatal. He proceeds—In the same detachment, a woman, anxious about the safety of her child, slept in the hospital tent, in which several choleric cases were present; in the morning she was attacked with the disease, and died. Three orderlies, also, slept in the hospital, and in the morning one of them was attacked, but recovered. ‘Thus it will be seen, four persons sleep in an hospital containing the infection of cholera, and that two are on the following morning attacked with the disease—whereas from the whole camp, consisting of 1500 or 1600, not five cases had occurred.’ ‘That the disease is contagious, appears to have been observed by the natives themselves, and it thus commonly happens that the sick are avoided by those whose duty does not call on them to attend. A village in which cholera is prevailing is usually evacuated for a short period, until the disease is annihilated; these, and many others, are the proofs of their opinion of its contagious nature.’—p. 189.

(48.) Mr. STOKES, in his very interesting and comprehensive report, states several well-ascertained facts, showing the infectious nature of the disease. The case of Mr. RUMBOLD, assistant-surgeon, is almost demonstrative. He had been visiting some very bad cases, when he was seized with sickness at his stomach, and giddiness; and coming out of the tent, he fell down faint, and from that period he believed himself infected with the malady. He soon became one of its victims. The sickness and faintness with which Mr. RUMBOLD, in a state of high predisposition ‘from fatigue of mind and

body,' was affected, may be easily accounted for by the information which Mr. STOKES gives in the following page. He states, that in the worst cases—' a peculiar
 ' and offensive foetor was observed to issue from the
 ' body, particularly when it was covered with much
 ' sweat; it was very disagreeable when first perceived,
 ' and seemed to hang about the nostrils, exciting, long
 ' after, an unpleasant sensation.'—p. 211. This gentleman, in another place, remarks—' It was found
 ' amongst many who came to the hospital, that some
 ' time previous to their being attacked, the disease had
 ' existed in the family to a greater or less extent, or
 ' some one branch had been ill or died of it. In others,
 ' it had spread progressively through the whole, or
 ' nearly; and among those who officiated as orderlies
 ' or attendants at the hospital, several were attacked, and
 ' some died.'—p. 217.

(49.) Mr. PATTERSON observes as follows:—' I feel
 ' convinced that a corps on its march, catching the ex-
 ' citing cause, will carry it along with the corps for weeks,
 ' and to a very considerable distance. Let this corps
 ' be halted on the finest spot of ground possible, let
 ' healthy corps join this, at short and regular intervals,
 ' and I feel convinced the disease would attack those
 ' healthy corps in a few days, and according to their
 ' respective arrivals. If this be not contagion, I do not
 ' know what name to give it.'—p. 224.

(50.) Dr. DAUN, whilst he refrains from giving any opinion as to the contagious nature of the disease, states the following facts in proof of it:—' On the 10th, when
 ' in attendance on O'Brien, I became indisposed in such
 ' a way as to lead me to apprehend an attack of the

‘ epidemic. On the 12th Mr. Gray was attacked, after
 ‘ having been up part of the night with Thomas Flan-
 ‘ nigan. Mr. Gray was, during his illness, constantly
 ‘ attended by Lieutenants S. and M^d., who have since
 ‘ had both of them attacks of the epidemic, and no other
 ‘ officers except them at this station have been attacked.
 ‘ Perhaps also this opinion might seem to receive some
 ‘ additional confirmation from the fact of Serjeant Mur-
 ‘ doch, the hospital serjeant, being attacked; and that
 ‘ Corporal Irwin was the non-commissioned officer in
 ‘ charge of the convalescents’ ward, and by his duty re-
 ‘ quired to be present twice daily in the hospital, and
 ‘ consequently must have been nearly as much exposed
 ‘ to the influence of contagion (if the disease really be
 ‘ contagious) as Serjeant Murdoch was.’—p. 273.

And lastly, as respects the official reports, Mr. KELLIE furnishes both facts and arguments, many of them similar to those already adduced in support of the infectious character of the pestilence.—*Mad. Rep.*, pp. 68—77.

(51.) Such is the evidence, which I consider amply sufficient, to prove that the disease, even from the commencement of its ravages, evinced, unequivocally, infectious properties. If my limits would permit, I could also demonstrate from the same sources that the eyes of many were shut, by previously entertained dogmas on the subject of contagion, against this property; and that several, even where they were arguing against its existence, were actually adducing important facts in support of what I have been cautiously led to believe in, namely, that the disease manifested a tendency to propagate itself by means of a morbid effluvium exhaled from the bodies of the affected, similar to what is evinced by measles,

and fevers whose infectious properties have been well ascertained and generally admitted.

(52.) It appears extremely singular, that notwithstanding the evidence which has been now quoted, in the very words of the reporters to the different Medical Boards, no means of preventing the propagation of the malady were resorted to during the number of years it has existed in the east. Surely the doubts even of the sceptical ought to have led to a careful inquiry; and most certainly the natives of the country, and the European population under the British dominion, had even a *right* to expect that those placed to watch over their health, and to devise measures for its preservation, would have attended to the unequivocal opinions expressed by a number of the best informed medical officers in the service; and that, although a great difference of opinion existed among them, this very circumstance should have led to more intimate inquiry and a careful sifting of the truth. At all events, the error—if error it could be called—should have been on the safe side; and the Medical Boards, superintending surgeons, or others, to whom the duty appertained, should have pointed out the importance of preservative measures to the government, and to civil or military officers placed over districts and corps, and have adopted the suggestion of one of their most able medical officers, who has stated the following in one of his reports to the Madras Board.—‘ Whether
‘ or not the disease in question be contagious is a sub-
‘ ject of infinite importance, and one which will require a
‘ vast experience unequivocally to determine; but where
‘ the slightest gleam of doubt obtains, it is surely better
‘ to adopt the means usual for the purpose of preventing

‘ its propagation, by appropriate *quarantine* of troops on the line of march, by preventing their immediate entrance into stations when under the influence of cholera. By these precautionary measures, I conceive it possible to preserve the lives even of thousands of individuals.’—p. 189.

That no precautions of any description were taken in India to prevent the extension of the disease, may be stated without any reservation ; and hence most probably the reason of its extension over so very large a portion of the whole globe.

(53.) Before leaving this part of the subject, it may be as well to take a hasty glance at the opinions expressed by some other authors who, having observed the disease in India, have written respecting it. Mr. ORTON, who published at an early period of the epidemic an able work on it, refers it to the electro-aërial influence. He now states his belief in its infectious nature. Mr. ANNESLEY expresses himself in his publication against the doctrine of infection, and imputes the disease to a similar state of the air to that assigned by Mr. Orton, without being able to point out in what this state consists. But ‘ *de non-apparentibus et non-existentibus eadem est ratio.*’ Mr. Annesley, however, appears not to have directed his attention sufficiently to the subject of infection in relation to the disease, to lead us to impart much importance to his disbelief in its existence. In proof of this, I may merely refer to the circumstance of his quoting the letter of a correspondent, containing the following remarkable proof of infection, without adding any explanation or remark :—‘ We have, however, been particularly fortunate till our arrival at this station, not having

‘lost a man, or having one seriously ill, though we had
‘been under canvass above five weeks. We fell in with
‘a battalion of native infantry who were suffering from
‘cholera; the next day six Europeans were attacked, the
‘number increased daily, and most of the first cases
‘proved fatal.’ Dr. KENNEDY, from extensive experience of the malady amongst both native Indians and Europeans, states facts and arguments, in his interesting publication, in proof of its infectious nature, and he justly places particular stress upon the peculiar odour exhaled from the bodies of the affected, as indicating the generation of a principle calculated to propagate the malady.

(54.) I have now shown, from the chief sources, that the disbelief of infection, in respect of the pestilential cholera, was not general in India—that the productions which issued from the three Medical Boards very strongly favoured, and indeed proved, the existence of this property,—that two out of the three actually insisted upon the activity of its influence,—and that, therefore, the dangerous opinion, so very generally propagated, and even acted upon, both in this and foreign countries, that the authorities in India did not consider the disease infectious, is entirely without foundation in truth.

(55.) The identity of this pestilence with that which has ravaged the East has been proved, and, indeed, is scarcely anywhere called in question. Some authors have supposed that it has acquired new properties since its first appearance and early prevalence in India, and that its infectious tendency is one of these. But I am entirely convinced that this is not the case. Even

varieties of the disease cannot be admitted; for it is essentially the same, presenting merely gradations of intensity, and modified effects according to these gradations.

(56.) Several authors of great merit have supposed that the disease has originated, and still continues to arise from time to time, in a number of distinct and far distant places, from those causes, to which the disbelievers in infection altogether impute it, and to which I shall immediately direct a brief attention; and that it has, owing to the combination of those circumstances and causes which are generally admitted to be productive of infection, assumed this character,—or, in other words, that the malady was not originally infectious, but that it has had this property superadded to it, from the circumstances of imperfect ventilation, neglect of cleanliness, and crowding together of the sick. There cannot be the least doubt of those being fertile sources of an infectious principle, and that they tend greatly to aggravate all diseases, whether infectious or non-infectious: but I have, in the course of my inquiries, remarked in numerous reports, and in the accounts of various observers, that the propagation of the malady from the affected to the unaffected frequently took place, although not to the same extent, or with the same malignity, in open, and airy, and thinly inhabited situations; and during opposite states of the atmosphere as respects both humidity and temperature.

(57.) Before I leave this part of the subject, it may be as well to examine shortly the proofs of the infectious nature of the disease furnished us in Europe and else-

where. On this topic I shall be very brief, because, having ascertained the identity of the malady in both hemispheres, and proved its infectious nature in India, it must necessarily possess the same character in Europe, unless counteracted by powerful means; and, therefore, a minute detail of facts is not required. Several authors have insisted on the proofs which have been furnished of the introduction of the disease into the Isle of France by the *Topaze* frigate, and the circumstance of about 20,000 of the inhabitants having been seized with it, above two-thirds of whom died, no precautionary measure having been resorted to; but that when the malady had been propagated to the adjoining island of Bourbon, a sanitary cordon was established, and only 256 persons were attacked. When the disease appeared in Aleppo, in 1822, the French consul, M. DE LESSEPS, convinced of its infectious nature, placed himself, his family, and all those who wished to join him, in strict quarantine, in a place adjoining the town. This colony, consisting of about 200 persons, remained perfectly secure from the disease, although 4000 persons died of it in the city. If it proceeded from some unknown state of the air, as supposed by the anti-infectionists, to what cause can we impute the escape of those who had so secluded themselves, for they surely must have breathed the same air as those who were affected? M. HUBENTHAL states, that a peasant having arrived from Arkatal, on the borders of Persia, at the village of Neskutshne, to visit an uncle, was seized, the night of his arrival, with the disease. The persons engaged in restoring the heat of the body by frictions, &c., four in number, were attacked on the following day, and three of them died.

Precautions were taken by the police to arrest the progress of the pestilence in the village, and it spread no further. If the causes of the seizure had existed in the air, or state of the locality, how came all the inhabitants, excepting those who had been exposed to the inhalation of the effluvia from the affected person, to escape?

(58.) According to the reports of the Medical Board of Ceylon, the disease made its appearance in 1819, in Jaffnah, in Ceylon, imported from Palamcottah, with which Jaffnah holds constant intercourse, and thence it was propagated over the island. In August, 1820, the *Leander* is stated to have called at Trinquamalee from Pondicherry, and to have landed several of her crew affected with cholera. Trinquamalee soon afterwards was infected, and the disease was again propagated over the island. The island of Sumatra was believed to have been infected in 1819, from the intercourse carried on between Achem and Malacca across the intervening strait; and it seems to have reached Penang and Singapore towards the end of the same year, in the same manner. Dr. LABROSSE states that the prisoners in the gaol of St. Denis, in the Isle of Bourbon, who were employed in the removal of the dead bodies, all died of the pestilence;—that, at the lazaretto, two servants alone escaped the disease;—and that in the hospital it was communicated to the attendants and other patients. M. MOREAU DE JONNES states that the malady was imported into Muscat, in Arabia, by the English East India ships; and Dr. SALINAS says that it was carried into the port of Bassorah, in 1821, by a vessel from India; and that it spread from this port, extending from town to town, even as far as the coast of Syria. When the pes-

tilence reached Manilla in 1820, where it was believed to have been imported by ships whose crews had been, or were, infected, the vessels in the harbour abstaining from intercourse with the shore entirely escaped. At Bangkok, the capital of Siam, it was said to have been introduced by the ships trading there from British India. It was supposed that 40,000 persons were attacked in this city and vicinity. Its appearance in Java, in 1821, was likewise considered to have been owing to the unrestricted intercourse of infected vessels, particularly the junks trading to Samarang, whence the pestilence spread over the island, carrying off upwards 100,000 of its inhabitants. Its irruption in Canton, in 1820,—in Macao, in 1823,—in the Moluccas in the same year,—and in various places in the Persian Gulf, and on the coast of the Arabian peninsula, was generally attributed to vessels which had arrived from infected places.

(59.) Dr. MEUNIER states that, at Bagdad, where a third of the inhabitants was attacked, none was affected but those who approached the sick. Dr. REIMANN says that there was not a single instance of a town or village in Russia which contracted the malady without previous communication with houses or persons affected. Drs. RUSSELL and BARRY, who were sent by the British Government to St. Petersburg, in order to investigate the nature of the disease, state the number of medical men and hospital attendants attacked with cholera in that city was extremely great, particularly in ill-ventilated hospitals; and they, as well as Dr. WALKER, who was sent to Moscow, express their belief in its infectious property. The report from these gentlemen to the Privy Council, dated the 20th of September, at St. Petersburg,

has been kindly allowed me for perusal by SIR WILLIAM PYM, and it abounds in proofs, remarkably in accordance with the quotation from Mr. SCOTT'S Report (see p. 38), demonstrating the infectious nature of the disease.

(60.) The director of sanitary police at Petersburg, Dr. REIMANN, after expressing his conviction that the Russian pestilence is entirely the same as that which has been so fatal in India, states that most decisive proofs have been furnished him that it has not been of indigenous production, but has been introduced by persons who have arrived from infected places on the borders of the empire. He further states that the physicians of Moscow have not had sufficient facts furnished them in that capital to judge with accuracy respecting its contagious properties, which he supposes to present certain peculiarities; but that he is convinced of its being less active, and less fatal, according as the place in which it is introduced is more airy, elevated, clean, and free from the usual cause of insalubrity; whilst its increased fatality in low, moist, thickly inhabited, and dirty places, has been demonstrated on numerous occasions. The personal and domestic cleanliness of the inhabitants has also a most remarkable effect upon the infectious property of the malady and its fatality. In proof of this, Dr. REIMANN states that in a village almost entirely peopled by Jews, 700 deaths occurred from amongst few more than 800 who were attacked. These conclusions are perfectly in accordance with the laws of all infectious diseases, and are entirely such as *à priori* reasoning would lead us to adopt.

(61.) In September, 1823, the disease first appeared

at Astracan, and the Russian Government resorted to preventive measures in order to arrest its progress. Whether or not those measures were the cause of its disappearance may be difficult to determine; but it did disappear, and it was not until 1830 that it showed itself again in that city. In 1828 the pestilence broke out in Orenburg, and was supposed to have been introduced either by the caravans which arrive there from Upper Asia, or by the Kirghis Cossacks, who are adjoining this town, and were said to have been about this time affected with the disease. During the winter the number seized was not great; but in the spring of 1829 it raged severely, and extended to the villages in the province. During its prevalence in this part of the Russian empire, many of the physicians, who at first did not believe in its infectious properties, were induced to change their minds, chiefly owing to the circumstance of the disease breaking out in places very soon after the arrival of persons affected with it. Several instances of this description have been recorded by Dr. LICHTENSTADT amongst the official documents published by him. Another circumstance favourable to the opinion as to its infectious nature was the peculiar irregularity of its course; and to this may be added, its extension in the lines of the principal roads and channels of traffic.

(62.) The introduction of the disease into Astracan, in 1830, was traced to a vessel which arrived from Baku, a town on the shore of the Caspian, and at that time affected with cholera. This vessel lost eight of her crew on the voyage, and the sick were brought to the lazaretto; a day or two after which the pestilence first appeared in this populous town. According to Dr. SOLO-

MOV, it attacked the suburbs on the 27th of July, and gradually extended to the nearest villages, and thence over the whole government. It proceeded through the Cossack stations and towns on the highway to Moscow, and up the streams of the Volga, at the mouth of which Astracan is situated. Its extension was attributed to the fugitives from the places successively attacked. After visiting the principal towns, and committing unheard-of ravages on the high roads to Moscow, the pestilence reached that city at the end of September. Towards the end of 1830, or soon afterwards, a body of troops from Koursk, a province at that time affected with the pestilence, was marched against the Poles. These troops carried this scourge along with them, affecting the places in their line of march through Podolia and Volhynia. In this way the towns of Astrog, Zaslaf, and Luck became infected; and from the last of these places the disease passed the Bug into Poland. Here it appeared with the invading Russian army, and was communicated to Lublin, Siedlec, Praga, the Polish army, and Warsaw.

(63.) The following is an extract from a letter written by a clergyman, who witnessed the disease in Saratoff, and published in the *Quarterly Review* for November:—

‘ Scarcely had we heard of the breaking out of cholera in Astracan, than the news came to us like lightning, that it was coursing the Volga, and that it was severe, and had already reached Zarczin. Without a dread of the presence of the angel of death, the vice-governor, the medical inspector, and the government, as well as the hospital surgeon, at once went into the infected places of this province. On the evening of

‘ the 6th of August we heard that three persons had
‘ been seized with cholera who had left Astracan, and
‘ were carried to our hospital. On the 7th, others were
‘ reported to have been carried off by this malady with
‘ such frightful rapidity, as to have impressed all minds
‘ with deep consternation, especially those who dwelt in
‘ the second division of the town. The disease soon ap-
‘ peared in the third division, and seized so many, that
‘ the hospital could no longer contain the sick, and
‘ killed so rapidly, that they scarcely survived six hours.
‘ The evil came so suddenly on us, that we had no time
‘ for taking precautions; our governor and our sur-
‘ geons were gone to meet it afar off, in order to pre-
‘ serve our city, but it was already among us before any
‘ regulations could be made, or any means of opposing
‘ it could be devised. It could scarcely be reckoned an
‘ epidemic, depending on some change in the atmos-
‘ phere, for many places were left untouched in our
‘ neighbourhood, while in Saratoff there was scarcely a
‘ family who had not to lament the loss of some of its
‘ members. All the poor who were attacked were in-
‘ stantly brought to the hospital, where there was neither
‘ room nor efficient aid, since the surgeons were absent.
‘ I myself saw the patients bled, and dosed with calomel,
‘ and rubbed with all sorts of unguents, yet all died
‘ who were attacked by the malady in the height of its
‘ virulence.

‘ In the very commencement of the epidemic, all our
‘ four surgeons were seized with it; two died on their jour-
‘ ney to Zaretzin, and one here. From this moment fear
‘ and anguish took possession of the public mind. They
‘ who could flee from the city, fled; and, as the malady

‘ was not considered contagious, servants, labourers, Tartars, and Russians, were permitted to rush into the country. My congregation, which consisted of 550 individuals, was reduced to 150. Many of the fugitives died on the road, and spread the malady whithersoever they went.

‘ From the 10th of August the malady increased in virulence; the daily mortality of 4 rose to 5, 12, 20, 80, 120, 200; and one day to 260, and decreased in the same gradual mode. Up to the 30th of August, 2170 persons died. While all around was infected, Sarepta*, in which the quarantine regulations were most strict, escaped, and yet this disease is not called contagious!’

(64.) From amongst other evidence—indeed, I may say a mass of evidence—that furnished by Dr. REIMANN, of St. Petersburg, as to the extension of the disease through Russia, may be adduced:—‘ The cholera was brought to Astracan by ships, and it has spread itself over Russia from Astracan by the emigration of the inhabitants, principally those of the lower orders. This is the chief cause of its propagation in Russia; it has never shown itself in any place except where it has been brought by travellers who came from infected places. *We have not a single instance* of a town, or of a village, which, without communication with houses or persons affected, has contracted the disorder. Several places surrounded by the disease have preserved themselves from it by a rigid insulation †’.

* This is a colony of Moravians.

† Letter to Dr. MARC.

(65.) The introduction of the pestilence into St. Petersburg is referred by Drs. BARRY and RUSSELL to the arrival of vessels from places on the Wolga, where it prevailed. In that capital the infectious nature of the disease was shown not only by the mode in which it was propagated in various quarters, and by its introduction into, and extension through, the prisons and hospitals of the city, but also by its exclusion from some places by a rigid insulation. Amongst numerous other instances the following may be mentioned:—Up to the 13th of July fifteen hospital physicians were attacked by the disease; and ‘the proportionate number of attendants of all descriptions on the sick, who have been taken ill with cholera, is fully greater than that of the medical men.’

‘There were 150 pupils on the officers’ side, (Military Academy at Cronstadt,) which is kept perfectly distinct from the school for petty officers and sailors. The gates were shut on the 19th of June, and as strict a quarantine as possible maintained to the 6th of August (O. S.). No case occurred amongst the pupils, who are from nine to twenty years of age*’.

(66.) In a letter from Dr. RUSSELL, given in the *Medical Gazette* for November 11th, the following remarkable fact is communicated:—‘The son of a villager in the government of Pensa, who was coachman to a nobleman, at fifty versts distance, died of cholera; the father went to the place to collect the effects of the son, and brought home with him his clothes, which he put on and wore a day or two after his arrival at his native village. He was shortly thereafter seized with cholera, and died of

* Reports of Drs. RUSSELL and BARRY.

‘ it: three women, who had watched him in sickness, and washed his body after death, were also seized, and died of the disease. The doctor arrived in time to see the fourth case; and, finding that it spread on that side of the village, he had the common street barricaded on the side where the disease had not reached, and interdicted all communication to the two sides of the village, even for the purpose of going to church. In that side in which the disease first broke out, upwards of 100 cases of cholera occurred, of whom forty-five died, but the disease did not appear on the other side of the barricade.’

And Drs. BARRY and RUSSELL report, that ‘ the Navarino corvette, Captain Naehinoff, 200 men, had been placed two miles to the eastward of Cronstadt during the epidemic, to question and examine all craft from St. Petersburg. She had eleven severe cases of cholera, of whom eight died. Her first and second cases occurred on the 26th of June, O.S. These two men belonged to the boat that examined the vessels coming from St. Petersburg, on board many of which they had been. The next men who fell ill were of those who carried the two first cases to the hospital in town. These are but a very few from the many facts of the same description now before me.’

(67.) With regard to the appearance of the disease in Berlin, the following extract of a letter from Dr. BECKER of that city, dated the 29th of September, 1831, and published in the *Quarterly Review* for November, furnishes important information:—‘ I am a most decided contagionist, and it is the force of facts which has made me so; for on the authority of your

‘ Indian practitioners I formerly believed the cholera not
‘ to be contagious. The appearance of the disease in
‘ Berlin, and the manner in which it has spread, is also
‘ very remarkable, and affords supplementary evidence
‘ in favour of contagion. The conclusion at which I
‘ have arrived is, that the *efficient* cause of the Asiatic
‘ or malignant cholera is always a virus, the production
‘ of *human effluvia*, and which, according to common
‘ medical language, undoubtedly deserves the name of a
‘ *contagious principle*; but that this virus, in order to
‘ produce the disease, requires, first, like the contagion
‘ of the small-pox, measles, typhus fever, and even the
‘ plague, a disposition of the atmosphere favourable to
‘ its development; and secondly, a peculiar disposition
‘ of the animal economy in every person who is ex-
‘ posed to it. This disposition appears to be brought on
‘ by previous disease, particularly bowel complaints, by
‘ excessive fatigue, cold, errors in diet, drunkenness,
‘ fear, &c. One young physician has been one of the
‘ first victims of the cholera, a decided anti-contagionist;
‘ he carelessly exposed himself, died, and, as if his case
‘ was to be a warning proof of the fallacy of his opi-
‘ nions, his death was immediately followed by that of
‘ his landlord and two children, and the illness of the
‘ servant-maid in the house, the only instances of the
‘ disease in that street.’

In a report subsequently given by Dr. BECKER respecting the disease, and published in the *Medical Gazette* of the 12th of November, 1831, it is stated distinctly that the disease was introduced by the vessels navigating the river Spree, which runs through the city.

(68.) The extension of the pestilence through Mol-

davia and Hungary to Austria, Vienna, &c., and through the north of Germany to Hamburg, and other places in the north as well as in the south of Germany, is well known. It has been stated that in Hungary alone nearly 400,000 persons have been seized with it, more than one-half of whom have died. The introduction of the disease into this country at the port of Sunderland, owing to the inefficiency of the quarantine regulations, must have now convinced the most sceptical as to its infectious nature.

(69.) I cannot more appropriately conclude this part of my inquiry than by stating the inferences at which the members of the Commission sent by our Government to St. Petersburg to inquire into the nature of the disease have arrived. They are entirely in accordance with the opinions which I had ventured to state in a paper on the disease published in the number of the *Foreign Quarterly Review* for October, 1831. These opinions were formed after a careful examination of all that had been written on the disease in this and foreign countries, and an examination of a number of the medical reports sent home by the different Boards in India, and lodged at the India House. Although circumstances had drawn my attention to the disease from the period of its irruption to the present time, yet it was not until after a recent, a patient, and laborious examination of the question that my mind was fully made up as to its communicability. The importance of the following conclusions, at which our Commission to Russia has arrived, can only be fully appreciated by those who know the great abilities, experience, and scientific attainments of the physicians composing it.

(70.) ‘ After having meditated on the above facts and
 ‘ documents from the moment they came to our know-
 ‘ ledge—after having weighed them all with the attention
 ‘ of which our minds are capable, and after having com-
 ‘ pared the opinions which all of us separately, and
 ‘ without discussion, had grounded upon them, we find
 ‘ our impressions as to the mode of origin and spread of
 ‘ the late epidemic of St. Petersburg and its neighbour-
 ‘ hood, so perfectly identical in all important particulars,
 ‘ that we now agree to and sign the following proposi-
 ‘ tions, containing the heads of our unanimous opinion
 ‘ on this part of the business of our mission:—

‘ i. That the germs of the disease were brought to
 ‘ St. Petersburg by the boats and barks which arrived
 ‘ from the interior this year previously to the 14th (26th)
 ‘ of June.

‘ ii. That those germs were diffused, and the disease
 ‘ propagated, in two ways; one which may be called
 ‘ personal, by the dispersion over the whole city imme-
 ‘ diately after the arrival of several thousand passengers
 ‘ and boatmen, who had come from infected places, or
 ‘ had been exposed to infection in the passage or on
 ‘ board these vessels. The other, which may be termed
 ‘ atmospheric, by emanations from the barks, and their
 ‘ contents suspended in and carried by the currents of
 ‘ air to susceptible persons, independently of direct com-
 ‘ munication.

‘ iii. That the germs of the same disease were carried
 ‘ to Cronstadt, and propagated there by boats and lighters
 ‘ which had been loaded directly from the barks already
 ‘ mentioned, by persons who had recent communication

‘ with these barks, or had been in their immediate neighbourhood.

‘ iv. That the disease was introduced to all the villages round St. Petersburg, in which we have been able to obtain authentic intelligence of its progress, by persons directly from the city, or from other infected places.

‘ v. That neither the near approach nor the immediate contact of an infected individual were indispensable to the infection of a healthy individual susceptible of the disease at the moment.

‘ vi. That the epidemic of St. Petersburg did not possess those absolute and indiscriminate communicable qualities attached to the plague and small-pox, and that the risk of the infection incurred by the healthy had been accompanied by shelter from currents of air passing through sources of infection.

‘ vii. That in a generally infected atmosphere the additional danger of infection incurred by approaching one or more individuals labouring under this disease was not greater than would accrue from approaching one or more typhus patients under similar circumstances.

‘ viii. That under favourable circumstances of body and mind, personal seclusion did afford protection against the disease, more particularly if that seclusion had been accompanied by shelter from currents of air passing through sources of infection.

‘ ix. That those continued exempt from the disease who retired from and avoided communication with infected places; and those who resided to windward of,

‘ and those who were protected from, the currents of air
‘ passing through such places ; that the next in point of
‘ immunity were those who, though living in the midst
‘ of general infection, avoided large accumulations of
‘ sick placed in confined atmospheres, the young, the
‘ vigorous, those who could afford to live well, yet lived
‘ temperately. In short, those who were placed under
‘ circumstances the most favourable to health, cheerfulness,
‘ and comfort of every kind.’

CHAPTER II.

The Infection of Pestilential Cholera assisted by predisposing, concomitant, and determining Causes.

(71.) IT may be briefly premised that this disease is never produced without the presence of a certain leaven, or morbid matter, emanating from the bodies of the affected, and, floating in the air, respired by those about to be attacked. This is the clear and only inference connected with its transmission that can be deduced from the body of evidence now placed before the reader. Those who argue against its transmissible nature cannot show, since the irruption of the pestilence in India, down to its arrival in this country, a single instance of its appearance in any place without the previous communication with an infected place or persons, of a nature to propagate the malady. The non-infectionists place great reliance upon the circumstance of the disease having, in several places, spared a large number of those who have come within the sphere of its influence.

But they must be aware that a similar circumstance is uniformly met with during the prevalence of all diseases acknowledged infectious. All who are exposed to them are not equally, and many are not at all, liable to be affected by them; and the person who may not have been susceptible of the infection to-day may be susceptible to-morrow, owing, very frequently, to the causes about to be noticed. This pathological fact is familiar to every observer in respect of small-pox, measles, scarlet fever, plague, and the true typhus—diseases whose infectious nature is very generally admitted, and wherefore should it be otherwise in respect of the present pestilence? The same fact, moreover, has been remarked of all pestilences of which we have any accurate information in medical annals. In illustration of this, I may notice what has fallen under my own observation. During the dry easterly winds which occasionally prevail on the west coast of Africa, it is frequently impossible, and always difficult, to infect the system with small-pox, even by inoculation; and when the operation succeeds, the disease is usually mild, and the eruption distinct; whereas, during the moist, close, and sultry weather following the rainy season, it spreads with the utmost rapidity; the effluvium from the bodies of the affected appears to be carried to considerable distances, and transmitted readily by means of various media, the disease being generally confluent, and most fatal.

(72.) The circumstance of so many escaping, besides being referable to this non-predisposition, may likewise be explained by the circumstance of free ventilation, the perflation of currents of pure air by modes of living calculated to oppose the invasion of the infectious effluvium,

and by being habituated to the influence of this principle. We frequently observe that persons constantly present in places contaminated by an infectious effluvium, are less liable to be attacked than those who are suddenly introduced from a purer air, but at the time predisposed to infection. This has often been demonstrated by the experience of others as well as of myself. Thus, a person confined in a close apartment with the true typhus-fever was visited by a friend: the visitor, upon entering the apartment, felt a peculiar disagreeable odour, which occasioned a slight faintness and nausea, followed by headache, indisposition to action, &c. This slight indisposition continued for several days, when, about eight or nine days afterwards, typhus-fever was fully developed. The person thus infected was kept in an airy apartment, and directions given as to ventilation, &c., with the view of preventing its extension, and the means employed succeeded as far as regarded the members of the family; but, when convalescent, a friend was admitted, and this person caught the disease. What the ultimate progress of the malady was in respect of this third person I had no means of knowing; but I have no doubt that the disease was communicated, in these two instances, if not in the one first referred to, whilst none of the constant inmates of the families were infected.

(73.) Another circumstance showing the operation of a specific cause in producing the pestilence, is its uniform and specific character in all climates, seasons, and localities. (§ 14, 15.) If the efficient causes of the disease were diversified, or consisting of the contingent combination of several, we should naturally expect a similar diversity of effects, and a constantly varying malady,

both at its commencement and during its advanced progress; but such has been shown not to be the case. (§ 15 *et seq.*) The efficient cause is specific, the disease itself is specific, and only modified as respects severity or grade, and the manifestation of certain subordinate phenomena, by the intensity of this cause, by certain predisposing, concomitant, and determining influences, and by the habit and temperament of the affected. (§ 91 *et seq.*)

(74.) Having stated that the pestilence is not communicable to any excepting to those who are circumstanced or disposed so as to allow the invasion of its exciting or specific cause, it will now be necessary to notice those circumstances which co-operate in this manner; and this is the more necessary, as those who deny the infectious nature of the disease, refer it altogether to certain influences which *predispose* the frame to the action of the specific cause, which reinforce or *accompany* it, or which, owing to their presence *after* exposure to it, determine its operation, or bring it more rapidly or more efficiently into action, when it might otherwise have failed of its effect.

(75.) Many of the earliest reporters and writers on this pestilence, who disbelieved in its infectious nature, had recourse to the state of the seasons in India to account for its occurrence. Some referred it to the prevalence of easterly winds, with long-continued or heavy falls of rain, by which the air was rendered moist and vitiated,—others, to sudden or extreme variations of the electrical conditions of the atmosphere, which variations were mere suppositions, and not matters of corroborated observation,—not a few, to the extrication of

some peculiar terrestrial miasm, projected in distinct or remote places from one another, and proceeding in singular currents, so as to involve a part of a village, or a detachment, or even company of a regiment, whilst the vicinity was intact,—and several could detect no other cause for it, but exhalations proceeding from low, moist, and swampy situations, and other sources of malaria, rendered peculiar by some unknown cause, or productive of this peculiar disease from errors in diet or incautious exposure. Now it should be kept in recollection, that the existence of all, or any of these, was merely supposition; that proofs were never adduced, and that the commonest meteorological observations were generally wanting. We find no uniform relation between the appearance of the malady, and marked variations in the barometer, thermometer, or hygrometer, even in the few places where these were registered; but we frequently observe the irruption of the pestilence in states of season, weather, and atmosphere, opposite to those to which it has been confidently imputed. But admitting that all the above-mentioned causes were actually in existence, (and we believe they were frequently present,) particularly during the severer irruptions of the disease, they merely show the truth of a part of my doctrine, viz. that the infectious nature of the disease was more strikingly evinced during conditions of the situation, season, and atmosphere, of acknowledged insalubrity,—that whatever tended to lower the energies of the frame, as such causes indisputably do, favoured the operation of the infectious effluvium issuing from those affected by this pestilence, and rendered it tenfold more prevalent, when they were concentrated or uncommonly active; and that, in this

respect, as well as in many others, the infection of pestilential cholera observes the same laws as other infectious maladies ; as scarlatina, measles, &c., manifesting itself in isolated cases, during healthy states of season and atmosphere, and breaking out into epidemics of greater or less extent, during seasons of marked insalubrity, and during peculiar constitutions and vicissitudes of the air.

(76.) So far, therefore, from disputing the influence of many of those causes to which many highly respectable authors have imputed this malady, I fully admit their operation, even although their existence is more a matter of inference than of observation. I deny, however, that they are sufficient for the production of the destructive effects which at present threaten the human species ; and contend that no such effects having, in the history of our species, been known to result from them, we cannot, with justice, admit that they are capable of producing them at the present epoch : I view them merely in the light of predisposing and concomitant causes coming in aid of a more powerful agent, which, emanating from the bodies of the affected, contaminates the predisposed in such a manner as to give rise to the same morbid actions as those which generated it ;—that these imputed causes favour the operation of this infecting agent, 1st, by predisposing the frame to its influence ; 2d, by reinforcing or assisting its action ; and 3d, by determining or calling into operation the infecting principle. The predisposing and reinforcing influence of the different causes already referred to cannot be denied. We know, or at least observe, too much of their influence in respect both of

contagious and infectious diseases which are familiar to us, to doubt their operation as regards the present pestilence: indeed their action would be a matter of undoubted inference to the well-informed physician, independently of the results of observation.

(77.) But besides the individuals of this class of causes noticed above (§ 75), there are others not yet enumerated, of equal influence, not only in favouring the operation of the efficient agent of the malady, but also in calling it into action after the frame has been exposed to its invasion. The chief of these are anxiety and depression of the mind; fear of the disease; physical and moral debility; low living and unwholesome diet; previous disorder of the digestive organs; neglect of personal and domestic cleanliness; deficient or filthy clothing; exposure to cold; the immoderate use of intoxicating liquors, or excess of any description; sleeping on the ground, or in low, ill-ventilated apartments, or in the open air; the use of cold, indigestible, or unripe fruits; cold drinks when the body is overheated; fatigue; sudden arrest of the cutaneous exhalations, however produced, &c. Either of these, whether acting shortly before, or at the time, or even soon after the body is exposed to the invasion of the infectious effluvium, will favour the production of the malady, particularly if several of them act in conjunction, and if, at the same time, those causes, whether proceeding from the state of the locality, or of the air, to which allusion has been already made, are also present.

(78.) It has been already stated, that a great number of the medical men called upon to treat this pestilence, have chiefly imputed it to this latter class of causes,

denying altogether the influence of infection; and the chief arguments which they advance, in order to show the absence of this property, have been referred to. (§ 71—73.) I verily believe that this malady is infectious in a similar manner to measles and scarlet or typhus fever; that is, not by contact, but from the inhalation into the lungs, along with the air, of the morbid effluvium given out from the body or bodies of the affected. We know that the mere contact of persons suffering from the diseases now mentioned, will not communicate them even to the predisposed; whilst the presence in the air which is breathed of a scanty portion of the effluvium given off, during their progress, from the affected, will often produce them: and such, I am convinced, is the case with the pestilential cholera. We further know, that it is impossible to perpetuate these acknowledgedly infectious diseases by inoculation, when access of the morbid effluvium to the lungs is prevented. It, therefore, can be no matter of surprise to learn that M. Foy, and others of the young physicians who visited Warsaw, failed to propagate the malady by inoculation, or by tasting the matters vomited by the affected; even although the tasting matters vomited, under any circumstances, might well have turned the stomachs of many. Who would ever succeed in communicating measles, or scarlet, or typhus fever, by attempting inoculation? Indeed, though cautiously convinced of the existence of the infectious nature of the pestilential cholera, I could have told those gentlemen that inoculation, or the introduction of the morbid secretions into the stomach of the healthy, even were they predisposed to an attack of the malady, would have failed, in accordance with the laws

which infectious diseases observe, to communicate it, provided the effluvium proceeding from the bodies of the affected be prevented from passing into the lungs. I as firmly believe that it is the inhalation of this effluvium and its influence on the lungs of the predisposed, that paralyze the nervous energy and functions of this very important and vital organ, occasion the singular collapse of it, observed after death and evinced during life by the state of the hypochondria, epigastrium, and respiratory organs, prevent the changes which the blood is destined to undergo in the lungs from taking place, and give rise to all the consecutive phenomena of the attack, as I am confident of any fact in pathology.

CHAPTER III.

Arguments of those who contend that the Disease is not Infectious, further noticed.

(79.) I HAVE adduced, in a previous chapter, a sufficient evidence of the infectious nature of this pestilence, and have stated, under the head of concurrent causes, those to which solely the anti-infectionists impute the disease. I have now to notice, more particularly than I have yet done, certain arguments on which they rely in favour of their doctrine; and,

First,—They contend that, having had sufficient and admitted proof that cholera has not hitherto been an infectious malady, either as occurring in warm or temperate climates, wherefore should it change its nature, and become infectious at the present time? The ready an-

swer to this is, that it is granted that the common cholera, whether that connected with a vitiated state of the biliary secretions, or that more severe form of the disease most frequently met with in warm countries, and denominated spasmodic cholera, or *mort de chien*, is not infectious; but that this can be no reason why the present pestilence, which is so very different in many respects from cholera, occurring from other causes and under other circumstances, possessing also very distinct characters (see the following Chapter), amongst which those of cholera are merely a part, and the least important part, should present this very important feature.

(80.) Secondly,—They contend that, if this malady were infectious, a greater number of those who come near the affected would be attacked; and because, under circumstances already alluded to (§ 71, 72), so many do escape, that, therefore, the disease is not infectious. This is the chief argument on which Mr. SEARLE, referring to what took place in his own hospital at Warsaw, relies in support of his opinions as to the non-infectious nature of the disease. But as respects the escape of a large proportion of those who are exposed to the infection, this pestilence resembles all other known infectious diseases, not excepting even the most virulent.

(81.) Much stress also has been laid upon the fact of the disease not having been communicated by inoculation, and by tasting the ejections; but this proves nothing, and is merely an illustration of what ought to be known to every medical man—that diseases which do not generate a specific virus cannot be propagated in this way. Who, I would ask, would expect to communicate measles, scarlet fever, or typhus

fever in this way? Who would expect to be affected by even a concentrated morbid virus on receiving it into the stomach? It is well known that the matter of small-pox and the poison of serpents may be thus applied without effect. That so many, or that all, even, of the attendants in an hospital should escape, is only what most medical men of any considerable range of observation would expect, reasoning from their experience; this point, however, has already been disposed of (§ 72, 78). But the facts are, even on this point, as respects this pestilence, opposed to the doctrine of the non-infectionists; for it has been proved on numerous occasions, several of which have been noticed when demonstrating, by direct proofs, the infectious nature of the disease, that a very large proportion of the medical men and hospital attendants were attacked, notwithstanding the absence of all dread with which medical men and their attendants view disease, and their habitual exposure to animal and other insalubrious effluvia. Besides, the odour of medicinal substances, where the laboratory is within the walls of an hospital, and where the attendants and others frequently inhale it, actually serves in counteracting the impression of the infectious effluvia on the lungs; and I am much in doubt whether any proofs can be shown, either in the East or in Europe, of the disease having spread in, or ever infected, the family of a chemist.

(82.) Thirdly,—The non-infectionists argue, that numerous instances of the true pestilential cholera have occurred, which could not be traced to exposure to communication direct or indirect with those previously affected. This may be the case in a few instances; but it may be asked, on how many occasions are persons

liable to be affected by an infectious principle, without being able to account for the manner in which it took place, to refer to the individuals whence it emanated, or the media through which it was conveyed? We know that infectious diseases may occur almost immediately after the impression of the existing cause, or not until after many days, or even weeks, according to the state of predisposition in relation to the intensity of the cause, during which interval, certain latent or almost imperceptible changes are going on in the frame; therefore, during so indefinite a period of interval between exposure to the cause and the development of disease, how can all those attacked refer to the particular occasion on which they were exposed to infection?

(83.) Fourthly,—The anti-infectionists refer to the occurrence of epizooties, in proof of a noxious emanation from the earth, which, floating in the air, affects both man and beast, and occasions this pestilence. I grant that emanations may, and sometimes do, arise from the soil, and affect man as well as the lower animals; and that, when this phenomenon takes place, it may be a concurrent cause of the pestilence, so far as to increase the predisposition to infection, and the fatal tendency of the disease. But, from a careful review of the occasions on which epizooties have been observed contemporaneously with the prevalence of this pestilence, I can state that they have been few, and merely coincidences, which by no means affect the question at issue. It should be kept in recollection that several of the seasons preceding, and during the prevalence of pestilential cholera, have been unusually wet, and that increased mortality amongst the lower animals is often observed

at such times. Many even of the instances of such coincidences on record are so vague, and so deficient in accuracy of details and dates, as to deprive them altogether of importance in the discussion of the subject. Besides, during the fourteen years that this malady has prevailed over a large part of the whole globe, it would have indeed been wonderful if the coincidence of epizooties with it had not been observed.

(84.) Fifthly,—Another argument made use of by the non-infectionists, is the circumstance that so many who have observed and treated the disease have espoused their side of the question. To this I may reply, that a very large number of those who have enjoyed this advantage have not had, even in India, as may be ascertained by referring to the reports of the Medical Boards, and to the documents at the India House, that extensive experience which we in this country suppose. It should be recollected, that a large proportion both of natives and native troops were treated by their native doctors. Besides, are we to expect those comprehensive views of the history and modes of propagation of a disease, from those who have seen but a little, and described only what they have seen; or from those who dispassionately investigate the origin, the causes, the phenomena, and the relation of all that has been observed and recorded, and cautiously weigh the evidence on either side of a disputed topic connected with it? The captain of a company, or even a colonel, performs an important part, individually, in an army during a general engagement; but he can know little, personally, of the disposition, changes, and evolutions of all its parts, and of the plan of strategy, according to which

it first acted, or was led to change its operations, in order to meet or counteract those of its opponent. Like the commander-in-chief of the whole army, we, who collect, compile, arrange, and digest facts, on both the one side and the other of a disputed subject,—who meditate closely upon them, and have our minds uninfluenced by prematurely conceived ideas, are the best suited to investigate, and to conclude respecting them. Placed, by the number of accumulated facts, and by minds accustomed to view and to investigate the difficult operations of nature, on the elevated table-land of human science, we may be admitted to be more able to take in a comprehensive view of the causes and nature of disease, and to come to accurate conclusions respecting it, than many of those who, as observation has shown, have drawn hasty inferences from a few and very imperfectly investigated occurrences.

(85.) Sixthly,—The non-infectionists also argue, that if the disease had been infectious its propagation would have been prevented by the measures resorted to. To this argument I reply, that the disease, during its prevalence in the East, was never expected to be confined by sanitary measures; that it was not until it reached Astrachan that any such measures were attempted, and then only imperfectly; and yet these succeeded for eight years in preventing its entrance into that place: and that, where rigorous quarantine has been adopted, the measure has succeeded, several instances of success having already been adduced.

(86.) They further state that several continental states and authorities, convinced of the inutility of quarantine, have relinquished it. Granting this to be the fact, it

merely shows, what any thinking person must admit, the impossibility of preventing the introduction of the disease into a populous town, situate in the vicinity of others, and of a thickly inhabited country, between which there must necessarily still be, even under the most strict quarantine, a constant intercourse of some kind or other, either by land or water, and perhaps by both.

(87.) But let me turn for a moment to the causes which the non-infectionists substitute for an infectious principle. Some argue in favour of a certain distemperature, epidemic condition, or altered state of the air, being the cause of the disease. Now these are mere suppositions. But grant them to exist, how would they explain the progress and propagation of the pestilence? The air is a very mobile fluid, sweeping along frequently at the rate of seventeen and eighteen miles an hour, and being constantly renewed, both in a horizontal and in a vertical direction, unless in situations where it can be confined. But the disease has not been propagated in the course of winds, or with the rapidity which such a source would suggest; it has advanced slowly, and at the rate at which human intercourse takes place, in the lines or channels of such intercourse, and in the quarters where intercourse with previously infected parts has occurred. It has usually spread in a town, visited prisons or sequestered places the last, but affected them severely when introduced; and it has entirely avoided those who placed themselves altogether apart from the rest of the community.

(88.) If the constitution of the air were the cause, how came isolated places, in the middle of infected towns, or in the track of the progress of the disease, to

escape? How could the disease be barricadoed, as it was in some towns in Russia, and shut out from certain districts and streets? How could it spread and travel along one side of a river, in the line of public intercourse, and never appear on the opposite side, or, if it did appear, either first or merely at the point where communication with the opposite banks takes place? When introduced into a country, wherefore should it break out first in sea-ports having intercourse with previously infected places, or in towns having inland communication with parts thus circumstanced? If the air were the source, how was its noxious property retained after passing hundreds, or even thousands of miles, as in the case of the appearance of the disease in the Isle of France; or wherefore did it, after this passage, respect the adjoining islands? How came the disease never to appear in any place without previous intercourse with a previously infected part, if it arose from a generally diffused state of the atmosphere?

(89.) Others, again, impute the pestilence to the exhalation from the bowels of the earth of some peculiar miasm. But the above arguments are equally weighty when directed against this supposition: for, independently of its being a mere assumption, as well as the foregoing, and putting out of the question the fact, that not a vestige of evidence has ever been adduced of any peculiar change of the atmosphere from its usual condition, or of any miasm, exhaled from the interior parts of the earth, having been observed coetaneously with the appearance of the malady, these causes, even if they did exist, could not account for the specific and uniform characters which it has always presented, in every situa-

tion, temperature, and elevation above the level of the sea, in all latitudes and longitudes, and from its commencement constantly to the fifteenth year of its prevalence. A distemperature of the air, whether from foreign gases, electrical states, or whatever other cause, surely could not for such a period, or under such a variety of circumstances, be so uniform and specific. Exhalations from the interior of the globe, whether proceeding from a great internal fire, from the action of circumambient agency, solar or lunar, or both, or from the electrical changes taking place in the more interior masses and constituents of our planet, surely could not, in all places, at all periods of this epoch, at all elevations, and under every combination of circumstances, be so uniform in their effects, so specific in their action, as the character of this pestilence shows its exciting cause to be.

(90.) If a noxious exhalation, proceeding from the more interior parts of the globe, caused the disease, it must on some occasions have risen through the depth of the ocean to have affected the crews of ships. Could this have taken place without it being changed by the medium through which it passed?

Where we find an agency—a specific effluvium, exhaled from the bodies of the affected, of which we have certain proofs, not merely as respects the manner of its operation, but also as regards its impression on several of our senses—wherefore should we have recourse to supposititious essences and to vain imaginings, to account for the propagation of the disease?

It may be supposed that more space has been devoted to this part of the subject than it deserves. I am, however, of a very different opinion: it is of the most transcendent importance; for upon accurate views re-

specting it altogether depends the success of measures to prevent the extension of the pestilence, and even to remedy it where preventive means have failed.

CHAPTER IV.

The Disease considered in relation to its Exciting Cause, and the effects of this Cause on the Vital Functions.

(91.) THE intimate relations and nature of this pestilence can only be inferred from a careful examination of symptoms, or phenomena, in connexion with their exciting cause, and with its effects, both direct and consecutive, upon the frame. The uniformity of the symptoms, under every circumstance of locality, climate, and constitution of the affected, would point, as stated above, (§ 14, 15,) to one specific or principal cause. But in what does this consist? The manner of the attack, the selection observed in its victims, the circumstances connected with the seizure, the characteristic symptoms which it presents, and various other considerations, strongly indicate, independently of the evidence adduced in proof of it, the existence of some animal poison or effluvium proceeding from the diseased and infecting the healthy. But in what way this poison, or leaven of the disease, first originated, there are no certain data from which to venture an inference. Did it originate about the period of the first irruption of the pestilence in the Delta of the Ganges, and propagate itself by extending its influence to the predisposed ever since, without any subsequent generation of the principle *de novo*, assuming more destructive features under circumstances which predispose to, or facilitate its transmission, as moist, unhealthy, or

epidemic states of the air, &c. ? Or does this disease arise in distant and unconnected places at nearly the same time, from some peculiarity of the air, or of its electrical states, or from some foreign material extricated from the earth, or floating in the atmosphere ; and, having produced the fully formed disease, an efflu-
vium emanates from the affected body, capable of inducing the same train of morbid actions as those in which itself originated, the infectious principle being thus generated *de novo* on numerous occasions ? That an infectious property is evinced by the disease, cannot be doubted by any one who intimately examines its phenomena, particularly in connexion with their origin ; but whether this principle originated with the first irruption of the malady, or has been reproduced on numerous occasions subsequently, the disease which reproduces it proceeding from a very different cause, is a difficulty which will not readily be solved. It cannot be believed, however, that, where the symptoms of the disease are uniformly the same, the causes which occasion it should be so entirely opposite as are aërial influence and an animal poison generated in the bodies of the diseased ; or in other words, that very different and very opposite causes should be *uniformly* followed by the same effects on every occasion and combination of circumstances ; the disease at the same time generating a cause which shall perpetuate it, of a very different nature from those in which itself originated. Indeed we have no evidence of the reproduction of this principle in distant and unconnected places, from causes different from itself, inasmuch as there is no evidence of the disease having ever appeared under such circumstances, or,

in other words, without communication with previously infected places; and hence we have no right to infer that a contingent combination of causes will reproduce this principle, until we have evidence to show that it does.

(92.) But in whatever way this question may be answered, if indeed it be ever satisfactorily answered, is not very material, as respects the nature of the malady. Whatever may be the exact origin of the efficient cause, there seems little doubt that it is inhaled into the lungs with the inspired air, where it acts as a poison, depressing the energy of the nerves supplying this organ, destroying the expansile actions it performs during respiration, and impeding those changes which the blood undergoes in the lungs. That the vital energy of the nerves distributed to the respiratory, the circulatory, and the secreting organs is either uncommonly depressed or entirely annihilated, is shown by the nature of the characteristic symptoms constituting the malady. The state of the respiratory function, particularly the laborious inspirations and rapid expirations, the coldness of the expired air, the involuntary and forcible retraction of the epigastrium and hypochondria, and the inexpressible oppression and anxiety referred to the chest, all indicate that the vital actions of the lungs are nearly suspended, and that the state of collapse and congestion, presented by them soon after death, had actually commenced during life. The state of the actions of the heart, the small, weak, and nearly abolished pulse, and the black colour of the blood, evince a suspension of those changes produced upon this fluid during respiration, and demonstrate not only a paralysis of the ner-

vous energy of the lungs, but a marked diminution of the nervous power actuating the heart and arteries ; the loss of vital or nervous power being necessarily followed by a suspension of the changes produced upon the blood in the lungs, and by a total cessation of all circulating and secreting actions, unless the vital power be reanimated. The vital or ganglionic class of nerves, (which forms a sphere of intimate union with each of its parts, supplies the lungs, the heart and blood-vessels, and all the digestive, assimilating, and secreting viscera; and when powerfully impressed in any one part, experiences a co-ordinate effect throughout the whole), is chiefly affected. Hence the arrest of all the natural secretions so rapidly supervening upon the morbid impression made by the cause of the disease on the nerves of the lungs,—hence the almost total abolition of circulation, assimilation, and secretion,—hence the congestions of the large vessels and vital organs,—and hence also the rapid extinction of voluntary power, as a necessary consequence of the suspension of those changes which, being produced in the blood, support the nervous energy and all the voluntary and vital actions. The retchings, evacuations, and spasms, so generally observed, frequently follow upon any sudden diminution of vital power, and upon congestions of the nervous centres ; and seem to answer wise purposes in the economy, inasmuch as they tend, by their influence on the circulation, to bring about a natural restoration of the vital actions, and to throw off the injurious load by which the springs of life are oppressed. They are efforts of nature to expel what is injurious, or to rally what is sinking. Where the powers of life are not too far reduced, these efforts

will be energetic and often successful, as very frequently remarked in respect of the less dangerous cases of this pestilence; but when the vital energies are far sunk, these efforts will generally prove weak and inefficient, even when assisted by rationally devised means.

(93.) It has been now shown, both by reference to the appearances displayed by investigations after death, and by connecting these with the phenomena presented by the disease during life, that the requisite changes are not produced upon the blood by respiration; and that the emunctories, which remove from the circulating mass those materials which would prove highly injurious and irritating to the frame if they were allowed to remain in it, have their functions entirely suspended. Can it, therefore, be a matter of surprise, that when reaction of the vital powers of the system is brought about, very great disturbance, not only of the circulating system, owing to the impure state of the blood, but also of the encephalon, and of the different emunctories, is immediately manifested? Indeed these consecutive states of disease, which have been well illustrated by observation, are entirely in accordance with *à priori* inferences in pathology.

I shall conclude this part of the inquiry by stating the inferences which may be drawn from an extensive view of what is known of the disease, as it has appeared in Asia and in Europe, as they lead to various considerations calculated to arrest the progress of the pestilence, and to remedy it, when an attack has not proceeded too far in the destructive processes in which it has been shown to terminate.

(94.) *A.* The pestilential cholera seems to be propagated by an animal miasm or effluvium of a peculiar

kind, emanating from the bodies of the affected; and this effluvium, being inhaled with the air into the lungs, paralyzes these organs and acts as a poison on the class of nerves which supplies the respiratory, the assimilating, the circulating and secreting viscera, vitiating also the whole mass of blood, and thereby occasioning a specific disease, which in its turn gives rise to an effluvium, similar to that in which itself originated; which, also, in like manner perpetuates its kind, under the favourable circumstances of predisposition, aërial vicissitudes, &c., and thus a specific form of disease is perpetuated and propagated far and wide, as long as predisposing, concurrent, and determining causes favour its perpetuation.

(95.) *B.* The morbid impression of this effluvium or poison upon the nerves of organic life, and probably the effect of its introduction also into the current of the circulation, are of a sedative kind, rapidly destroying the vital energy of the former, and vitiating the latter, and thereby giving rise to the characteristic phenomena of the malady.

(96.) *C.* The impression of this effluvium on the organic class of nerves, and the vitiated state of the blood, may be viewed as the proximate cause, not only of the disturbance evinced by the respiratory, the secreting, the assimilating, and the circulating functions, but also of the morbid actions of the stomach and bowels, as well as of the muscular spasms, the sinking of all the vital and animal powers, of the shrunk and collapsed state of the surface of the body, of the black, thick state of the blood, and of the rapid depression of the animal temperature.

(97.) *D.* The morbid state of the perspiration, and

the peculiar appearance of the evacuations, proceed from the alteration produced in the vitality of the frame, and in the condition of the blood; and it is chiefly through the medium of the cutaneous surface of the liver, and of the mucous membranes, assisted, perhaps, also by the other secreting viscera, that this morbid state of the blood is remedied, and its impurities removed; and that the morbid effluvium or poison which propagates the disease, is formed on these surfaces and membranes during the elimination of the impurities generated in the circulation.

(98.) *E.* The advanced stages, or the consecutive symptoms of the disease, whether those chiefly depending upon the state of the nervous functions, or of the circulation within the brain, or proceeding from the condition of the abdominal viscera, arise partly from the shock received by, and the depression of, the vital energy of the frame in the early stage, partly from the arrest of the secretions and the unchanged and impure state of the blood, and partly from the congested condition of the large veins and important viscera.

CHAPTER V.

Of the Diagnostic Characters of the Malady, and its difference from former Epidemics.

(99.) Much misapprehension of the nature and origin of the pestilential cholera has arisen from viewing it merely as a modification of, if not identical with, the form of cholera not unfrequently met with in India and other warm climates, and occasionally in this country, to which the terms *spasmodic cholera* and *mort de*

chien have been applied. Many writers, particularly those who argue against the infectious nature of the present pestilence, have considered it merely an epidemical occurrence of that form of cholera. It is true that, in the spasmodic cholera, the secretion of bile is either altogether or nearly interrupted; or, if it be at all discharged into the bowels, that it is so vitiated as to prove extremely irritating to their internal surface, the spasms, retchings, alvine evacuations chiefly arising from a powerful cause of irritation to the organic nerves supplying the digestive tube and the abdominal viscera, together with accompanying congestion of these vessels. But in this disease there is every reason to suppose that the absence of bile is to be imputed to spasm of the common bile duct, rather than to a suppression of the secreting and excreting functions,—whilst, in pestilential cholera, these functions are altogether arrested, and the discharge of bile is interrupted, independently even of any spasm of the excreting ducts,—the biliary secretion being suspended as well as all the other glandular secretions of the frame.

(100.) In the spasmodic, or severe form of sporadic cholera, the discharges from the stomach and bowels are certainly either not coloured by bile, or but little, excepting at the commencement, and when the disease begins to yield; but they are accompanied with a different train of symptoms. The spasms are more tonic, and confined more to the muscles of the abdomen and of the thighs and legs, than in the pestilential disease; and, in the former, the vertigo, deafness, headache, marked affection of the respiratory function and of the circulation, characterizing the latter, are entirely wanting.

In the former disease the very dark and ropy appearance of the blood; the cold, wet, and shrivelled state of the surface, and its dark or purplish colour; the almost total absence of pulse at the wrist; the very marked and rapidly increasing collapse of the powers of life; the disagreeable and earthy odour of the body even during the life of the patient; the burning sensation between the scrobiculus cordis and umbilicus; the complete arrest of all the glandular secretions; the cold tongue and mouth; and the coldness of the respired air, which characterize the pestilential disease, are entirely absent.

(101.) In one, the powers of life are certainly very much deranged, and the circulation and functions of the internal organs greatly disturbed; but in the other, all the derangements and their attendant symptoms are of a much more alarming and malignant nature; the balance of the circulation is much more completely overturned, the circulating fluid itself much more sensibly and seriously diseased; the respiratory functions infinitely more disturbed; the spasms of the voluntary muscles more general, and more clonic as respects their nature; the purging and vomiting slighter and of shorter duration, and forming a less prominent feature of disease; the surface of the body more deprived of its vitality, of a much darker colour, and more collapsed and shrunk; and the powers of life are more completely overwhelmed, and sooner sink altogether, than in the severest forms of cholera observed to occur occasionally in warm climates, or in temperate countries, under circumstances favourable to their appearance.

(102.) In this pestilential malady, the powers of life

are insufficient of themselves, even although assisted by the administration of stimulants, to overcome the congestion of the internal organs, and restore the circulation in the surface of the body and in the extremities; and while the large secreting viscera in the abdomen remain engorged by the thick and viscid blood thrown in upon them from the external surface, and their vital powers overwhelmed, their functions of secretion must necessarily be arrested; and thus they are unable to remove the load oppressing them, by one of the modes in which congestion of secreting organs is usually overcome.

(103.) In the severer forms of cholera, occurring sporadically, the derangements, being less malignant than in the present malady, are more readily removed by an energetic and appropriate treatment. Here the exhibition of large doses of calomel, opium, and stimulants, is generally sufficient to allay the inordinate action of the stomach and bowels, to restore the balance of the circulation, remove spasm, and to excite the secreting function of the liver. But in this pestilence the lungs are completely paralyzed, the changes produced by respiration entirely suppressed, the blood thick and vitiated, the large vessels, particularly the large venous trunks, and the cavities of the heart, are so engorged with blood, as to be unable, particularly in their state of deficient vital energy, to react upon the distending fluid, and to throw it, particularly in its state of morbid density and tenacity, into the extreme vessels of the secreting organs and external surface, unless internal and external stimulants of the most powerful kind be employed; and even these are often inadequate, of themselves, to the intention with

which they are employed, and occasionally are productive of mischief, unless the engorgement of the internal viscera be early removed by vascular depletion and external medication, which, while they relieve the heart, and empty the large vessels, enable them to react upon their contents, and recall the flow of blood from the centre to the circumference of the frame. Hence it is generally indispensable, in this very formidable disease, to exhibit stimulants and antispasmodics internally, with artificial heat and stimulating frictions, in order to rouse the vital energy of the system, whilst we remove the vascular load by means of emetics and evacuations of blood, and afterwards endeavour to excite the functions of the liver, and restore the secretions generally.

(104.) Amongst the other characteristics intimately connected with the nature of this pestilence, and calculated to distinguish it from all those states of disease to which the term cholera has been usually applied, may be particularly noticed the prevalence of the pestilence in all seasons, countries, and climates; the affection of the head, nervous system, and respiratory organs, characterizing the commencement of its attack; the uncommon and sudden diminution of the animal temperature, which often sinks below the heat of the surrounding air, both on the surface of the body and in more internal parts; the remarkably sudden and rapid depression of the powers of life; the continued restlessness and distress referred to the præcordia and epigastrium; the mental apathy and indifference to the result; the vertigo, stupor, and deafness; the blue colour and shrunk appearance of the surface of the body; the state of the respiratory actions, and peculiar groan or whine

of the affected; the unquenchable thirst, and burning at the epigastrium; the sodden, raw, wet, and shrunk state of the surface; the rapid exudation of a watery fluid from the skin, and digestive mucous surface; the states of disease by which it is very frequently followed; the unprecedented mortality, notwithstanding the most energetic and judicious treatment, and the use of those means by the aid of which nearly all the cases, even of the most severe forms of intertropical cholera, generally recover; and, lastly, the appearances observed after death, particularly the collapsed state of the lungs, the blackness of the blood, the fibrinous concretions in the cavities of the heart, the morbid secretion lining the internal surface of the intestines, the flaccidity of all the soft solids and of the substance of the heart itself, and the congestion of black blood on the large nervous centres. (See § 33 *et seq.*)

(105.) The *consecutive phenomena* (§ 23), or those which follow upon the cold and blue stage of the malady, also furnish remarkable proofs of dissimilarity between this pestilence and the severe forms of cholera observed in hot countries, or in temperate climates after very hot and moist seasons. After these latter the patient recovers without any consecutive disease, and frequently the tumult of the frame leaves it benefited by the changes it induces; but, in the present pestilence, the consecutive states of disease are often as dangerous as the earlier stages; and, even when assuming a typhoid or febrile character, they do not communicate a febrile disease, but the distinct and specific pestilence now treated of. This important feature has been happily insisted upon in the Reports of Drs. BARRY and RUSSELL.

(106.) Various attempts have been made to trace a resemblance between this disease and some of those which have occurred in former ages, and of which very imperfect accounts have been furnished by writers; but, upon referring to the meagre details which have been given of them, I am unable to trace any close resemblance between them—far less identity. Mr. ORTON* has endeavoured to find out a very close similarity between this pestilence and that which ravaged England and some parts of Europe at various periods, between the years 1483 and 1551, and which obtained the [name *Sudor Anglicanus*, *Ephemera Maligna Sudatoria*, and *sweating sickness*. In certain phenomena the similarity is close, but in others altogether wanting; but as it cannot lead to any practical results, I will not further pursue the subject.

(107.) It may be important, however, to be aware, that poisoning from acrid and narcotic substances, and particularly tobacco, or those belonging to the class of animal poisons, occasions symptoms which, in many respects, closely resemble those characterizing the present pestilence. But the difference will be apparent upon inquiry into the history and premonitory symptoms of the attack, and by observing the collapsed, shrunk, dark, and wet state of the surface of the body; the sodden, shrivelled, damp, and raw state of the extremities; the spasms, the oppressed respiration, the sunk appearance of the epigastrium, and of the hypochondria; the peculiar character of the matters ejected; the cold, raw state of the expired air, and the black, viscous condition of

* On the Indian Cholera. 8vo. London. 1831. p. 112.

the blood, all of which characterize this pestilence, and are either altogether absent from every other kind of attack, or never similarly associated.

(108.) After attentively considering the phenomena and nature of this malady, I would conclude :—

1st. That neither the causes which occasion this pestilence, nor the pathological states which constitute its various grades or stages of intensity, have any connexion with those of either of the forms of cholera, whether the common *bilious* variety, or the more severe form, usually denominated *spasmodic*, the *mort de chien*, &c., and that, therefore, the name cholera should be discarded from all scientific descriptions of it.

(109.) 2nd. That the accounts which we possess of the epidemics and pestilences which have ravaged various countries in former times do not furnish us with the history of any disease which may be considered as identical in its nature with the prevailing pestilence, and that it must, owing to this circumstance, and to the uniformity of its characteristic phenomena, be viewed as being of modern origin, and *sui generis*.

(110.) As it is important that the name of a disease should not be such as may risk its being confounded with another, different from it in its nature, symptoms, and termination, so I consider that some other name than that at present applied should be given it. As to the particular appellation which may be employed, I conceive that one pointing to its chief pathological states, and its prominent tendencies, ought to be preferred. The intense influence of its exciting cause upon all the respiratory actions and functions, as well as upon the actions of the heart and state of the pulse, and its

marked tendency to propagate itself, and to terminate fatally, induce me to apply to it the name of *Asphyxia pestilenta*, or *pestilential asphyxy*; and I would venture to give the following definition of it:—

(111.) *Nosologically*:—Great oppression and anxiety in the chest, epigastrium, and præcordia; with giddiness, nausea, disturbance of the bowels, faintness, and general depression of the vital energies of the frame; a cold, clammy, purplish, and shrivelled state of the surface; coldness and rawness of the expired air; ejection of the contents of the stomach and intestines, with general spasms, tremors, and distress; a sense of painful or burning heat about the epigastrium, with urgent thirst, and rapid disappearance of the pulse and of the animal heat;—the malady sometimes followed by a more active state of disease affecting chiefly the cerebral or abdominal organs.

¶ (112.) *Pathologically*:—Paralysis, more or less complete, of the lungs; arrest of the changes effected by respiration on the blood, and of all the glandular secretions; sudden depression and rapid sinking of the heart's action; the circulation of a dark and otherwise vitiated blood through the arteries, with congestion and stagnation of this fluid in the large veins, sinuses of the encephalon, and internal viscera: at last, a black, glutinous condition of the blood, with congestion of it in the cavities of the heart, particularly those of the right side, followed by death: in some cases, the congestion of the internal viscera being accompanied with, or followed by, an obscure and asthenic reaction, affecting chiefly the encephalon, or the viscera contained in the abdomen.

SECTION III.

OF THE PREVENTION OF PESTILENTIAL CHOLERA.

(113.) THE extremely fatal tendency of this disease, however early, energetic, and judicious may be the treatment employed, renders the consideration of preventive measures of the greatest importance. For, by well-devised means, the disease may be so circumscribed, and the action of its exciting cause on the frame so counteracted, that it will at last gradually disappear.—Whereas, when it is in any instance fully developed, the morbid actions constituting it are so remarkably severe, and so intense in degree, and so rapidly fatal in their tendency, as to set at defiance all means of cure,—the vital actions are often so completely overwhelmed by the exciting cause of this pestilence, as to be incapable of being rallied, or even impressed by the known agents of our art.

(114.) The measures of prevention which are required against this pestilence naturally divide themselves—1st. Into those which governments ought to take, on the part of the community, in order to exclude it from a country, district, or place, which it has not hitherto visited. 2nd. Into those which are required when it has approached the confines of, or has actually entered, a country or district. And, 3rd. Those measures which concern individuals more particularly, and which they may adopt of themselves for their own safety and that of their families.

CHAPTER I.

*Of Government Regulations of Prevention,
or Quarantine, &c.*

(115.) To the neglect of the measures which belong to this head, is chiefly to be imputed the extension of this pestilence throughout all the countries of the east. The difficulty, however, of putting them completely in force, and the liability of evading them in all countries, particularly those which are continental, and have an extended boundary, which are thickly inhabited, particularly on their frontiers, have large and populous frontier towns and sea-ports, and enjoy a rapid and extensive commerce, either by sea or land, are so great, that numerous instances of their infraction must occur, and the chances of the introduction of the pestilence thereby increased. These circumstances fully account for the importation of the malady into the principal towns and sea-ports of Russia and Prussia; its appearance in Moldavia, Hungary, Austria, Vienna, Dantzic, Hamburgh, &c.; and the negligence with which quarantine regulations are usually resorted to, fully explains the introduction of this pestilence into Egypt, into this country at the port of Sunderland, as well as into numerous places in other countries, where stricter precautions might have reasonably been supposed to prove successful.

(116.) As intimately connected with all regulations of quarantine, the period which elapses from the impression of the morbid cause upon the frame, and the full development of the disease, requires some notice, but

unfortunately, sufficient facts have not been obtained, and those which have been observed are not sufficiently precise to furnish us with exact data on this topic.— Various circumstances, however, serve to show that the full developement of the morbid actions constituting this disease may take place very soon, even a few hours, after exposure to an intense degree of its exciting cause, or when the state of predisposition to become affected has been great; whilst, on the other hand several, perhaps many, days often elapse before a marked effect is produced. As to the exact length of time which may, in extreme cases of this kind, thus elapse, I have no means of stating; but even taking it for granted that a few days merely will often form this period of latent or smouldering action, it becomes obvious that a person may have been exposed to a source of infection, previous to leaving an infected place, that he may travel a long distance and yet not experience the disease, until some time after his arrival in a healthy situation, when he may be attacked, and thus he will introduce the pestilence.

(117.) The unknown duration of the interval which elapses between the infection of the malady, and its full developement, must render it doubtful what should be the prescribed period of quarantine; but there can be no doubt of the propriety of regulating it according to the length of time during which persons, or vessels, have been on their passage from an infected place, provided that no source of infection existed in their course. I believe that nothing can be objected to the measures which have been resorted to in this country respecting ships; but it remains a question in what point of view articles of merchandise are to be considered.

(118.) That the chances of infection by articles of this description are much less than by persons, may, I think, be safely taken for granted ; but I should still consider those articles which are most likely to have imbibed a portion of the effluvium of the affected, as made clothes, articles of bedding, furs, cotton, woollen, silken, and linen furniture, and rags, to be calculated to transmit the infection. In all cases, therefore, those should be either prohibited, or subjected to precautionary measures, and particularly to a full exposure to the open air. It is often astonishing how very long woollen and silken bed and body clothes, especially, will retain animal effluvia, when closely packed together, or excluded from ventilation. This must be familiar to every medical man who has been in the habit of continuing for a considerable time, or to be frequently, in dissecting rooms ; for the animal miasm which his clothes have there imbibed will be sensibly felt months afterwards, if they have been put in a close place immediately after they were saturated with the foul air.

(119.) That sanitary measures will succeed, in averting a visitation of this pestilence, will much depend upon the nature of the frontier of a country, upon its extent, the number of populous places in its vicinity, and the nature of the intercourse between it and infected parts. In respect of this last-named source of infection, illicit intercourse, or smuggling, is one of the most probable channels through which the disease will be communicated ; and when the population is thick, and the towns large and numerous, the chances of the disease being introduced in this manner are much greater than by regular commercial intercourse, inasmuch as the latter is more or less under the control of sanitary regulations, whereas the former avoids them altogether.

CHAPTER II.

Of Sanatory Measures when the Disease appears in a country.

(120.) It has always been remarked, that when this pestilence has appeared in a country, it shows itself first in places nearest the frontier or coast, or which are in communication with a previously-affected part. This holds in respect of all the eastern countries and European states which have been visited by it. It is obvious, that when once introduced into a populous and commercial town, surrounded either by other towns or by a dense population, the difficulty of preventing its extension is uncommonly increased; for in all such places, particularly those which are chiefly dependent upon manufactures, and commerce with distant places, measures sufficiently restrictive to confine the malady there until it shall have exhausted itself, will be productive of so much distress, throw so many out of employment, abridge the means of subsistence, and thus injure the health, and predispose to the local extension of the malady, that all classes will at last combine to evade them, until, at last, the pestilence will spread in spite of these vexatious and imperious restrictions.

(121.) When the malady first appears in a town thus circumstanced, the chief measures of precaution should be directed to the habitations in which it breaks out. These should be subjected to the measures which will be pointed out in the next chapter; intercourse between the

affected house and those adjoining, and between their inmates, should be prevented, or placed under rigorous restrictions, and thus the pestilence may be strangled at its birth. If it spread notwithstanding, more will be obtained from the employment of the means hereafter to be noticed, than from those which aim at accomplishing what cannot be enforced—namely, the maintaining a strict non-intercourse with the vicinity. Where, however, this object may be attained with reasonable hopes of success, it should not be neglected. But in a place where, besides a frequent intercourse with other parts by shipping, an hourly communication by means of stage-coaches, waggons, canals, and rail-roads is kept up with other towns in all directions, I cannot see that quarantine or sanitary *cordons* can be strictly maintained, or regulations be enforced in such a manner as to prevent the extension of the malady. How can goods, even those most likely to transmit the pestilence, be sequestered for the purpose of purification, and yet avoid all chances of conveying it? And how, especially, are the hundred or even thousands of persons whom their avocations call to adjoining parts, many of whom may have been exposed to infection previous to their departure, to be placed in quarantine, or in observation, for a sufficient time to avoid all chances of their conveying the disease to the places of their destination?

(122.) I conclude, therefore, that where a strict quarantine, or sanitary measures calculated to confine the pestilence to the place of its irruption, cannot be maintained, the mischief resulting from the attempt will be greater than the benefits which will arise to the community. But that where they may be enforced, owing

to the nature of the locality, the employments of the population, the distance from other towns or populous places, and the thinly inhabited state of the surrounding country, they should be adopted, notwithstanding the temporary losses or even distresses of the place thus sequestered, for the good of the few should give place to the safety of the many.



CHAPTER III.

Means of Prevention to be adopted by Individuals or by Families—or Prophylactic Measures.

(123.) As intimately connected with the *preservative measures* to be adopted against the pestilential cholera, there are three facts which require to be kept in recollection:—1st. That a peculiar principle or effluvium proceeding from the diseased is necessary to the communication of the malady. 2d. That this effluvium is inhaled with the air into the lungs, where it makes its more immediate morbid impression on the frame; and 3d. That peculiar predisposition to receive or to become affected by this effluvium is equally required. In what this predisposition consists is not sufficiently known, further than that the debilitated, the physically and morally depressed, and those the vital energies of whose frame are greatly reduced, by whatever means, are more disposed to contract the disease than the robust and well-fed. Upon these three facts are our prophylactic measures chiefly to be based.

(124.) As respects the first of these, but little may be said, further than that every rational measure (of which those treated of in the preceding chapters are most important, particularly as respects the community) to avoid exposure to the morbid effluvium which occasions the disease, whether emanating immediately from the bodies of the affected, or mediately from other sources, should be resorted to. Under this head, as strict seclusion as possible, and shunning intercourse with those most likely to have been amongst the infected, are deserving of attention.

(125.) Much advantage will also result from avoiding the predisposing and concurrent causes of the disease. Whatever tends, directly or indirectly, to debilitate or fatigue the body; whatever lowers its vital energy, as excesses of every description, low and unwholesome diet, and insufficient clothing, disposes to the operation of the exciting cause of the malady. On the other hand, whatever tends to support this energy, and preserve, in their due regularity, the healthy functions of the frame, serves to render it impregnable to this agent. Exposure to cold, to chills, to the night-dew, to wet and moisture; the use of cold fluids, and of cold, flatulent, and unripe fruits, ought to be carefully avoided. If at any time exposure to the night-air or to cold and moisture is inevitable, the system should be fortified against them, but the mode of doing this requires caution. It should not be attempted, unless when better means are not within reach, by wines or spirits, and, even then, these should be used in very moderate quantity; otherwise they will leave the system, as soon as their stimulating effects have passed off, more exposed than before to the

invasion of the infectious effluvium producing the disease.

(126.) Medicinal tonics, however, and those more especially which determine the circulation to the surface of the body, at the same time that they improve the tone of the digestive organs, and promote the regular functions of the bowels and biliary system, may be resorted to on such occasions. For this purpose the infusions or decoctions of bark, of cascarilla, of calumba, &c. with the spirits of Mindereri, or any warm stomachic medicine; or the powdered bark, or the sulphate of Quinine, or the balsams, may be taken either alone or with camphor, or with the aloes and myrrh pill, and any one of the spicy aromatics*. These medicinal means are especially called for whenever the disease is present in a

* Any of the following recipes may be employed for the purposes here recommended.

R. Decocti Cinchonæ ℥iv.
 Liq. ammon. acetat. ℥ij.
 Spirit. ammon. arom. ℥ij.
 Tinct. capsici annui ℥xx.
 Spirit: Pimentæ ℥ij. Misc.

Fiat mist. cujus capiat coch. j. vel ij. vel iij. pro re nata.

R. Infus. cascarillæ ℥vss.
 Potassæ sub-carbon. ℥j.
 Tinct. aurantii comp. ℥iij.
 Spirit. lavandul. comp. ℥jss. M.

Fiat mist. cujus capiat cochlear. ij. vel iij larga, mane nocteque.

R. Quininæ sulphatis ℔j.
 Massæ pilulæ aloes et myrrhæ ℥ss.
 Extr. Anthemidis ℥j. M.

Fiant pilulæ xx. quarum sumatur una mane nocteque.

town or house in which the person resides; and they should be had recourse to when he retires to sleep, and in the morning before he leaves his room. He should, moreover, avoid sleeping in low and ill-ventilated apartments; and be equally distrustful of sleeping near, or even of passing through, in the night-time, close and unwholesome situations and streets, particularly without having resorted to the medicinal means now suggested.

(127.) Care should be taken never to be exposed to the morning or night air, with an empty stomach. A cup of coffee previous to such exposures will be serviceable. The state of the stomach and bowels should be always attended to, and their functions regulated and carefully assisted; but in no case should these objects be attempted by cold, debilitating medicines, such as salts. The warm stomachic laxatives, or those com-

R. Camphoræ rasæ ʒj.
 Extr. gentianæ
 Pilul. aloës cum myrrha ā ā ʒss.
 Pulv. capsici gr. xv.
 Syrup. simp. q. s. M.

Fiant pilulæ xxiv. quarum capiat binas mane nocteque.

R. Camphoræ rasæ ʒj.
 Pilul. galban. comp. ʒss.
 Quininæ sulphatis gr. xii.
 Balsam. Canadensis ʒj.
 Pulv. capsici annui gr. x.

Fiant pilulæ xxx. secundum artem, quarum capiat binas primo mane ac nocte.

R. Bals. Canad. ʒss.
 Pulv. rhei ʒij.
 Confect. arom. q. s.

Fiant pilulæ xvij. quarum capiat binas primo mane et hora somni.

bined with tonics, may be adopted with advantage as occasion may require*.

(128.) Particular attention ought to be paid to personal and domestic cleanliness. The surface of the body should be kept in its natural and perspirable state. The constant use of flannel nearest the skin will be serviceable for this purpose. Excessive perspirations ought to be avoided.

The diet should be regular, moderate, nutritious, and easy of digestion. Whilst every approach to low living should be shunned, its opposite ought never to be indulged in. The stomach should have no more to do than what it can perfectly accomplish, without fatigue to itself, but to the promotion of its own energies. It must never be roused to a state of injurious excitement by means of palatable excitants, nor weakened by over distention or too copious draughts of cold relaxing diluents.

(129.) The state of the mind also requires judicious regulation. It ought never to be excited much above, nor lowered beneath its usual tenour. The imagination must not be allowed for a moment to dwell upon the painful considerations which the disease is calculated to bring before the mind; and least of all ought the dread of it

* R. Quininæ sulphatis ℥j.

Extr. aloës purificat. ℥ij. | }

— gentianæ ʒj. M.

Fiant pilulæ xxx. quarum capiat binas, vel tres, pro dosi.

R. Pilul. cambogiæ comp.

— Aloës cum myrrhâ ʒā ℥j.

Quininæ sulphatis gr. xii.

Extr. gentianæ ʒss.

Contunde simul et divide in pilulas xxiv. quarum capiat binas vel tres pro re nata.

to be encouraged. There is a moral courage sometimes possessed by individuals who are the weakest perhaps as respects physical powers, enabling them to resist more efficiently the causes of infectious and epidemic diseases, than the bodily powers of the strongest, who are not endowed with this species of mental energy. Those who dread not attacks of diseases, and who yet exercise sufficient prudence in avoiding unnecessary exposure to their predisposing and exciting causes, may justly be considered as subject to comparatively little risk from them. This, I am persuaded, is particularly the case as respects the pestilential cholera, and I wish to impress it upon the minds of those whom the observation concerns. On all occasions a fool-hardy contempt or neglect of ailments, especially those affecting the stomach and bowels, ought to be guarded against, and the best medical advice be immediately procured upon the first manifestation of disorder.

(130.) During the occurrence of the disease in our vicinity, or family, these precautions are still more imperatively required. A free ventilation of every apartment ought to be constantly observed; in conjunction with fumigations, by means of aromatic substances kept slowly burning, or by the vapours of the chloruret of soda or of lime. If a quantity of a very weak solution of the chloruret of lime be put in a vessel, and some muriatic acid poured on it, and placed in the hall, or the very lowest parts in a house, the disengaged gas will soon find its way in sufficient quantity to the higher apartments*. The attendants on the sick should particu-

* For more particular directions respecting this mode of fumigation, see the *Appendix III.*

larly observe the measures now prescribed, and ought never to exert their attentions on the affected so near their persons, as to inhale the effluvium emanating from them, without at least fortifying the vital energies in the way pointed out; and they should carefully avoid entering upon those duties with an empty stomach, or when fatigued.

(131.) Besides burning warm aromatic substances, and odoriferous gum-resins, in the apartments, and in those adjoining them, in which affected persons are or have been confined, a saturated solution of camphor in aromatic vinegar, or in the pyroligneous acid, should be occasionally sprinkled on the floors, furniture, and bed-clothes. These means, with a thorough ventilation, and a due attention to cleanliness, will not only, I am persuaded, counteract the influence of the effluvium proceeding from the affected, and ward off its action even on the predisposed, but will also prevent the clothes, bedding, or furniture of the apartments of the sick from becoming imbued with it, to such an extent as can communicate the malady. They are within the reach nearly of all; and, in the event of the extension of the pestilence to any considerable town or city, if care were taken to see them put in practice, under the direction of medical councils of health, one of which should be formed in each district, or quarter, much good would result from them. Keeping in recollection the principle with which I set out, namely, that the exciting cause of the disease undoubtedly makes its first impression on the nerves of the lungs, the advantages of those measures, from the circumstances of their being applied especially to this organ, must be obvious.

SECTION IV.

OF THE CURATIVE TREATMENT OF THE PESTILENTIAL CHOLERA.

(132.) THE means of cure which should be employed, in order to secure even a moderate share of success, ought to be appropriately prescribed, and strictly directed to the various pathological states and stages which the disease presents in the different habits and constitutions which it attacks, and in its various grades of severity. It is, in my opinion, in some measure owing to a neglect of this strict appropriation of the varied means of treatment recommended, and to the empirical manner in which they have been administered, that opinions have been so different as to the utility of the greatest number of them.

(133.) In order that the remedies chiefly depended upon by the numerous writers who have recorded their opinions respecting the treatment of this malady, may be more strictly referred to the circumstances under which they seem to be indicated, and often to have really proved beneficial, I will *first* succinctly state the chief forms and stages of the disease, with reference to its various grades of intensity, and existing pathological conditions; I will *next* detail, with strict reference to its different states and stages, the treatment I would venture to recommend in each of them respectively; and, *lastly*, briefly notice the methods which have been employed by various authors.

CHAPTER I.

Of the chief Grades and Stages of the Malady, [with reference chiefly to Curative Measures.

(134.) THE mode of attack, as well as the severity of the disease, vary materially, according to the intensity of the exciting cause, the nature of the concurrent causes, the state of predisposition, and the strength of the patient's constitution.

(135.) THE INVASION of the disease generally presents itself in *three* different grades, owing to the above causes. The *first* and least dangerous grade or state of invasion is the most gradual, and is usually that of a common diarrhœa, varying in duration from a few hours to one or two days, accompanied with great oppression in the chest, and anxiety at the præcordia, and collapse of the countenance and surface of the body. If these symptoms be neglected they soon pass into those characteristic of this malady, viz. marked and sudden loss of pulse; oppressed and difficult respiration; muscular spasms or tremors; shrunk, wet, and leaden appearance of the surface and extremities; sunk eyes, and watery vomiting and purging, with great distress. This is generally the *least severe* form of the malady, and is commonly met with in the younger and more robust class of subjects. For the sake of distinction I shall term it the slightest grade, or that characterized by premonitory diarrhœa, &c.

(136.) The *second* state of invasion is the most frequent, and is generally ushered in by cerebral symptoms

such as giddiness, noise in the ears, by a remarkable oppression of the chest, weight at the epigastrium, and a great depression of the pulse and of all the vital energies, rapidly followed by spasms commencing at the farther parts of the extremities, and accompanied with watery purging and vomiting, and all the symptoms described in the early part of the work, (§ 19, 20). This is the common form or degree of severity of the malady.

(137.) The *third* state or form of invasion is the most sudden and fatal. The patient is suddenly seized, as if struck by lightning, or by a severe blow on the epigastric centre. His vital powers are immediately laid prostrate; and he is usually found without pulse at the wrist; with most laborious respiration; shrunk, purplish, raw, wet, and cold condition of the surface of the body; and collapsed, terrified state of the countenance. This *severest grade* of the malady generally seizes on the old, the debilitated, or most highly predisposed persons; and often terminates life in a few hours, with a most rapid and continued sinking of all the functions.

(138.) This *last* form or state of the disease is generally beyond the reach of medicine; it is chiefly in the two former that medical means avail. These *three* modes of invasion and grades of the distemper should be distinctly borne in mind, as requiring very distinct and decisive modes of cure.

(139.) Besides attending strictly to these STATES of the disease, as indicated chiefly by the modes of its INVASION, the practitioner is required to notice attentively the PERIODS or STAGES which mark its course.

The *first* of these, or the cold and blue stage, is that of *extreme depression*, the symptoms indicating the ut-

most sedative effect of the exciting cause of the disease on the vital powers, with a morbid state of the circulation. The extreme degree of this period constitutes the *third*, or severest form of the malady (§ 137), it being so marked as to entirely overwhelm life in a short time, without any other period or stage supervening.

(140.) The *second period* is that of morbid reaction, and is evinced by returning warmth and pulsation, and diminution of the leaden state of the surface. It passes either into convalescence, or into exhaustion and disorganization. This period, as stated above (§ 21, 139), may not appear as in the severest forms of the disease. And, when it does supervene, it may present the symptoms already described, when treating of the consecutive phenomena of the malady. (§ 23-25.)

(141.) It would seem that, in many instances, life is not destroyed by the morbid state forming the first period of the disease; nor is it so completely overwhelmed as to prevent all reaction; but that the reaction which is produced, being accompanied with the morbid state of the blood, and a considerable share of the congestion of vital organs characterizing the preceding period, is necessarily imperfect, and readily passes into an adynamic state of sub-inflammatory action, affecting chiefly important and vital organs, and often assuming the form of malignant fevers complicated with particular visceral disease.

(142.) The *third stage*, or that of exhaustion and disorganization, is always a consequence of attempts at reaction, which are, however, often imperfect and extremely morbid in their nature (§ 141), chiefly owing to the marked impression made by the exciting cause on

the vital energies, and to the very evident deterioration of the blood. This stage takes place more or less rapidly, and, when once present, the fatal tendency is great, but yet, notwithstanding, sometimes to be controlled and prevented by judicious and decided means.

(143.) In a very large proportion of cases, the febrile symptoms arising from reaction, are accompanied with more or less of congestion or of a sub-inflammatory state of some vital organ, frequently of several, as of the encephalon, alimentary canal, liver, lungs, &c. and when the consequent collapse terminates in death, these organs manifest the nature and extent of their disturbance.

(144.) It should be kept in recollection that the *second stage*, or that of reaction, as well as its consequences, namely, exhaustion and disorganization, can only occur in the *first* and *second* grades of the disease, or in those cases which have not proved fatal from the *first*, or cold stage. The *second* stage is identical with, and presents the phenomena described as forming the consecutive states of the disease (§23-25). Owing to the important features it often assumes, it requires a more particular notice.—1st. A congestive and sub-inflammatory state of the encephalon and spinal marrow, assuming the characters of typhoid, or malignant nervous fever, and proving the most frequent and fatal form of the second period.—2d. A bilious or bilio-nervous form of fever.—3d. A sub-inflammatory state of the stomach, or of the bowels, and frequently of both conjoined. And, 4th, an irritative or sub-inflammatory state with congestion of the lungs, accompanied with oppression and pain in the chest, cough and viscid expectoration.

(145.) The *exhaustion* into which these states gradually pass, and which forms the third or last stage of the malady, is generally attended by symptoms indicating more or less congestion and change of structure, particularly of those organs which manifested the chief disturbance during the period of re-action. Its accession is often rapid. It requires to be accurately recognized and promptly met, in order to ensure any share of success in combating it.

(146.) When death occurs in the first stage, as it often does in the highest grade of the disease, the chief changes are observed in the blood, the lungs, and vascular system (§ 33), the functions of the organic or ganglionic nerves being so rapidly abolished, from the impression of the exciting cause of the malady, that the morbid influence can be evinced only on this system, and there chiefly as respects the state of the circulating fluid—a sufficient length of time, to produce disorganization to any very remarkable extent, not having elapsed between the invasion and termination of the disease. But when death takes place after the period of reaction, organic changes are observed in various important viscera (§ 34), which, with the disturbance of vital functions, and in which they chiefly originate, account for the fatal result.

It will be necessary to acquire precise ideas of the foregoing *forms* and *stages* of the malady, in order to devise appropriate means for counteracting their fatal tendency.

(147.) *Synopsis of the Forms and Stages of Pestilential Cholera depending upon the severity of attack.*

First grade. — With marked premonitory symptoms, particularly diarrhœa, &c. (§ 135.)

Second grade. — Commencing with giddiness, faintness, &c. rapidly followed by the characteristic features of the disease. (§ 136.)

Third grade. — The seizure sudden and intense. (§ 142.)

First stage, or that of depression (§ 139), — being occasionally followed by death, but more commonly by the

Second stage, or reaction, or febrile affection. (§ 140.)

A.—Reaction with typhoid, or maligno-nervous febrile affection. (§ 144.)

B.—With gastro-enteric affection, &c. (§ 144.)

C.—With bilious affection, &c. (§ 144.)

D.—With pulmonary affection, &c. (§ 144.)

E.—With two or more of these conjoined.

Third stage, or that of exhaustion and disorganization.

Most frequently consisting of the stage of depression only, rapidly terminating in death, and more rarely followed by reaction and the stages and states above enumerated.

CHAPTER II.

Of the Treatment appropriate to the foregoing Grades, Stages, and States of the Disease.

(148.) IN order to combat successfully a disease of such extreme intensity and danger as the present is, it will be necessary to combine our medical means judiciously and energetically, to bring several agents into action at the same time, and to direct them to different organs and opposite parts of the frame. Thus, while we exhibit medicines internally, by the mouth and in the form of injection, it will be requisite to employ, contemporaneously, various means, externally, to different parts of the body; and while we endeavour to accomplish certain objects or intentions, we must not entertain them separately or successively, but collectively, and in a direct manner. In the following exposition, therefore, of the plan of treatment, it ought to be kept in recollection, that the intentions of cure about to be proposed should be attempted to be fulfilled, as far as possible, conjointly and immediately, and by a judicious combination of those means which can only be mentioned in succession. In order that my remarks may possess as much precision as possible in their application to the various circumstances of the disease, I will, at the risk of unavoidable repetitions, offer them in relation to the varying states and stages of the disease.

(149.) *A. Treatment in the FIRST or milder grade of the disease.* In the *first* stage of this grade of pestilential cholera, the following intentions of cure may be entertained:—1st. To remove the congestion and oppression of the internal viscera ; 2d. To restore the circulation to the external surface of the body and extremities ; 3d. To stimulate the vital energies and restore the animal warmth ; 4th. To bring about a salutary reaction and a return of the secretions. These intentions will generally be fulfilled; more or less conjointly or all together, by a scientific and energetic combination of the internal and external remedies calculated to accomplish either of them singly.

(150.) The *first* and *second* of these intentions of cure, more especially, are obtained in two ways, one of which ways is actually pointed out to us by certain of the morbid actions we are required to remove ; the others are indicated by reasoning and experience. It has been remarked, that, although vomiting and purging are both generally present in this disease, they seldom, particularly vomiting, are urgent or copious ; and that the matters rejected, especially after the usual contents of the alimentary canal are thrown off, merely consist of a serous fluid, unmixed with any of the natural secretions, which is exuded from the digestive mucous surface, owing to the interruption of the circulation through the abdominal viscera, and to the congestion and stagnation of blood in the large veins.

(151.) We know that full vomiting is one of the means by which the living frame either rids itself of what is injurious to organs essentially vital, or restores the balance of the circulation when it is suddenly over-

turned, and when the blood accumulates to an injurious extent in important viscera. Now the same means which the powers of the constitution exert, but exert imperfectly, or in vain, owing to their depressed state and their want of due aid, are those which I would recommend amongst the earliest which should be put in practice. Every man of observation must have remarked the decided influence of full vomiting in removing accumulations of blood from the lungs, liver, and large veins, in determining the flow of this fluid to the external surface, and giving rise to a copious warm perspiration; and he must likewise have been struck by the opposite effects which uniformly follow continued nausea or inefficient sickness and attempts at vomiting.

(152.) In addition also to the indications which the operations of the economy point out for our adoption, experience furnishes us with strong evidence of the propriety of the practice. It has long been inculcated by the ablest authorities in our science—by those who have observed extensively, thought felicitously, and reasoned correctly, that full vomiting is amongst the most salutary measures that can be adopted in the state of depression which follows the noxious impression of injurious agents on the frame, particularly of the exciting causes of remittent and continued fevers, inasmuch as it tends, more than any other, to induce a salutary reaction, and to restore the suspended secretions. Guided by those lights of our profession, by the indications which nature holds out, and by its physiological effects, I have always employed this important mode of treatment in such cases, and not merely in those, and in the incipient stage, or that of depression, but also in a much more advanced

period, or in that of collapse, when it has been requisite to rouse the energies of the frame, and restore the secretions.

(153.) Bearing also in recollection those views of the nature of the disease which I have endeavoured to place before the reader (§ 92-98)—namely, that it proceeds from a certain miasm or poison, which depresses most inordinately the vital manifestations of the ganglial class of nerves, and deteriorates the mass of blood, we naturally refer to those known means or remedies, which our experience has shown us to be most successful in counteracting agents of a similar kind and giving rise to analogous effects to those proceeding from the exciting cause of this disease. These means we know to consist chiefly of emetics, stimulants, and blood-letting, assisted by various other remedies, employed as energetically and as much in conjunction with each other as possible, and followed by other very important measures. Emetics and stimulants excite the paralysed energy of the ganglial nerves, overcome internal congestions, bring back the suspended secretions, and, by restoring them, remove the hurtful materials contained in the circulating fluid; whilst depletion overcomes the internal congestion, and gives freedom to the oppressed and cramped action of the heart.

(154.) Following, therefore, the obvious intention of nature herself, and following the results of experience in analogous cases, I would propose to have immediate recourse to *full vomiting*, both as a means of recovering the lost balance of the circulation, and determining the fluids to the surface of the body, and as a powerful agent in exciting the paralysed nerves of organic life (the

ganglionic), and in restoring the natural secretions, which are more or less suspended, and which have been replaced by a scrous fluid, exhaled or exuded from the digestive mucous surface in consequence of extreme congestion of the collatitious viscera, but not really secreted by that surface.

(155.) As intimately connected with our intentions of cure, it should be borne in recollection, that the fluid copiously discharged from the surface of the body during this stage of the disease is given out in a similar manner to that evacuated from the digestive mucous surface, and that both the one and the other consist merely of an exudation of a portion of the serum of the blood, owing to extreme relaxation of the exhaling pores of these surfaces, conjoined to congestion of, and interrupted circulation through, the large veins and vital organs; and that these evacuations are incapable, owing to their nature and the mode of their production, of removing hurtful or poisonous matter from the blood. It is only when the vital function of secretion assumes the place of passive exhalation, that the blood experiences those changes which are requisite to its purification and to the continuance of life.

(156.) *Emetics*, therefore, are amongst the earliest measures which should be put in practice—but not trusted to alone, even for a few minutes; they should be employed conjointly with other means about to be detailed. Much discretion will be manifested by, and, indeed, much of the benefit resulting from this practice will depend upon, the choice of emetics, and the form of their exhibition. In this state of disease I would prefer the sulphate of zinc, or the ipecacuanha powder, com-

joined with warm stimulants, as prescribed below*. If full discharges from the stomach be not produced by the above means, a copious draught of the warm infusion of camomile flowers may be taken, containing some carbonate of ammonia, or any other diffusive stimulant.

(157.) Contemporaneously with the exhibition, or action of an emetic, *blood-letting* from a large vein seems to be required, and to be sanctioned by experience, particularly in young and tolerably robust subjects, and when the pulse is not remarkably soft, broad, or open. It has generally been remarked, that the difficulty of obtaining blood from a vein, owing to its thick, viscid state, and its stagnation in these vessels, is extremely great. This state of the blood seems to be partly owing to the exudation, from the mucous surfaces and skin, of a large portion of its serum, and to the abolition of the function of absorption by which the serous portion of the blood is always replaced under

* R. Pulv. rad. ipecacuan. ℥ss.
 Ammon. sub-carbon. ℥j.
 Aq. menth. pip. ℥ijss.
 Tinct. capsici ℥j.
 Olei anthemidis ℥x. M.
 Fiat haustus.

R. Zinci sulphatis ℥ij.
 Aquæ menth. pip. ℥ivss.
 Solve, et adde
 Vini ipecacuanhæ,
 Tinct. serpentariæ āā. ℥ss.
 Tinct. capsici ℥ij.
 Olei anthemidis ℥xii.

Misce, et fiat mist. cujus capiat partem tertiam, vel quartam, intervallis brevibus.

ordinary circumstances. But so strong have been the objections entertained, with very few exceptions, by the Indian practitioners, to the administration of cold fluids, which the affected so greatly desire in order to quench their extreme thirst and burning heat at the epigastrium, derived from their fear of increasing the sickness and vomiting—of actually doing what the efforts of nature are attempting, but are generally unable to accomplish without aid—that the means of repairing the loss of the serous part of the blood have seldom been furnished to the distressed patient, even when calling for what his instinctive feelings inform him are requisite to his existence. Were full vomiting first promoted, by the exhibition of emetics conjointly with other means, the circulation would be determined to the surface of the body, internal congestions removed, the obstruction of the biliary ducts overcome; the bile accumulated in the gall-bladder and in these ducts would be propelled onwards, and thrown into the duodenum, and the chief cause of continued and depressing nausea would be thus removed. The stomach would be afterwards more readily quieted, and be able to retain a sufficient quantity of fluid, whence the loss of the serous parts of the blood would be repaired, and the deterioration of this fluid would thus be partly remedied.

(158.) Blood-letting is efficacious in proportion to the earliness of its employment. In all cases of this malady the patient ought to be bled in the recumbent position, and the finger kept on the artery, in order to ascertain whether or no the pulse rises during the operation. If it does rise, blood may be abstracted until the usual effect upon the pulse begins to appear, when no further quantity should be taken, and care should be had not to

produce even incipient syncope by the operation. If we find that the blood-letting occasions a still greater depression of the pulse, instead of restoration of it and amelioration of the symptoms, the operation ought immediately to be put a stop to. In cases where blood can scarcely be otherwise obtained, the operation of full vomiting will greatly promote its flow, and secure the good effects of the venesection.

(159.) The removal of congestion and the equalization of the circulation will be promoted, and the good effects of blood-letting increased, by the contemporaneous application of dry warmth to the surface of the body, and by frictions. Dry warmth may be readily applied by placing the patient instantly in bed, and elevating the bed-clothes around him by two or three common hoops, or pieces of whalebone, and then introducing one end of a wide tube, at the other extremity of which the flame of a spirit-lamp, or even of a common lamp or candle, should be made to pass*; or bags of hot salt, or hot bran, or oats, may be placed around him.

(160.) The above intention will be greatly promoted by employing assiduously, at the same time that external heat is being applied, frictions of the abdomen, chest, and thighs, with a liniment composed of two ounces each of liquid ammonia, of olive oil, and of spirits of camphor, with three ounces of spirits of turpentine, and a few drachms (from three to six) of hard soap and Cayenne pepper, to which one or two drachms of cajeput and lemon oils may be added.

(161.) These means may be assisted by the adminis-

* A simple and cheap apparatus for the purpose has been devised by, and may be had at, Mr. Green's, Great Marlborough Street.

tration of æther, camphor, ammonia, calomel, opium, aromatic spirits, and volatile essential oils, in such forms of combination as the circumstances of particular cases may point out. The subjoined formulæ may be taken as examples*, and be employed alone, or to wash down from fifteen to twenty grains of calomel, given either as a simple powder, or in pills. If the vomiting and purging be extremely urgent, and particularly after full vomiting has been produced, or when it proceeds beyond what is sufficient to remove internal congestion, and restore the balance of the circulation, and yet is incapable of accomplishing it,—if the vomiting exhaust the vital energies instead of bringing about reaction, the above medicines should be exhibited in the least bulky manner, or in that which may best secure their retention,

* R. Aquæ menthæ pip. ℥j.
 Liq. ammon. acet. ℥ij.
 Spirit. ammon. arom.
 — æther. sulph. co.
 — lavand. co. āā. ℥ss.
 Tinct. opii ℥xx. M.

Fiat haustus statim sumendus et pro re nata repetendus.

R. Infus. caryophyl. ℥jss.
 Spirit. pimentæ
 — rosmarini, āā. ℥ss.
 Tinct. opii ℥xx.
 Olei cajeputi ℥x. M.

Fiat haustus ut supra sumendus.

R. Aq. cinnam. ℥jss.
 Magnes. carbon. ℥ss.
 Spirit. ammon. arom. ℥ss.
 — æther. arom. ℥j.
 Olei rosmarini ℥vij. M.

Fiat haustus statim sumendus.

and be combined accordingly*. If they are rejected, they should be repeated notwithstanding, when they will generally be ultimately retained. They may afterwards be repeated at intervals, varying with the circumstances of the case.

(162.) If the irritability of the stomach continue, and if the attack be severe, then flannels wrung dry out

* R. Hydrarg. submur. gr. xx.
Pulv. opii gr. j. M.

Fiat pulvis, cum haust. aliquo super-præscrip. sumendus.

R. Hydrarg. submur. gr. xv. ad xx.
Pulv. opii, gr. j.
— cinnamom. gr. xii.
— nucis mosch. gr. vj. M.

Fiat pulvis in vehiculo quovis crasso sumendus cum haustuum aliquo super-præscript.

R. Camphoræ rasæ gr. iij. ad x.
Hydrarg. submur. gr. xij. ad xx.
Opii puri. gr. ss. ad gr. jss.
Conserv. rosarum. q. s.

ut fiat bolus statim sumendus.

R. Hydrarg. submur. gr. x. ad xx.
Opii puri. gr. ss. ad gr. jss.
Syrup. simp. q. s. M.

Fiant pilulæ ij. vel iij. quamprimum capiendus.

R. Opii puri, gr. ss.
Hydrarg. submur. gr. iij. ad vj.
Magnes. sub-carbon. gr. x.
Olei cajeputi (vel menth. pip.) q. s.

ut fiant pilulæ iij. tertiis vel quartis horis sumendæ cum haustuum aliquo ante-præscript.

R. Camphoræ rasæ gr. iiij. ad viij.
Ammoniaë sub-carb. gr. xij.
Hydrarg. submur. gr. x.
Opii puri. gr. j.
Conser. rosar. q. s. M.

Fiat bolus.

of very hot water, and immediately soaked in warm oil of turpentine, ought to be instantly applied, as warm as possible, over the stomach and abdomen, and retained there, or renewed, until a decided effect is produced. This is the most powerful means I am acquainted with, and the most successful, in procuring reaction and restoring the heat of the body.

(163.) The foregoing means frequently accomplish the last of the intentions of cure enumerated above (§ 149), by fulfilling those which preceded it. But we should never consider the patient to be placed in a fair way of recovery by bringing about reaction merely, unless the suppressed secretions be also restored. It should be kept in recollection, that an early effect of the exciting cause of the disease is to vitiate the whole mass of blood, and that this morbid state can be removed only by supplying the loss of the serous parts of the blood exuded from the mucous surfaces, and by exciting and calling into active and healthy action the functions of the secreting organs, particularly those of the abdomen. In order to attain this end, large doses of calomel, followed by purgatives or aperients, are required.

(164.) Calomel was very uniformly employed in India, and generally in conjunction with opium, in some form or other, and certainly few remedies succeeded better in allaying the vomiting, when the disease was neither uncommonly severe nor too far advanced. In cases of moderate severity, and when given early in the attack, it seems to have been remarkably beneficial in restoring the secretions of the abdominal viscera, particularly of the liver; and in these, in conjunction with bleeding, it seems to have had no mean share in preventing the consecutive states of disease, into which this

pestilence so frequently passed, more particularly the nervous and malignant state of fever sometimes following it in India, but more frequently in Russia. Mr. OGILVY (*Bomb. Rep.*, p. 210) remarks, that where the calomel affected the mouth, the consequent symptoms of bilious fever were not observed. Its good effects will be promoted by combining it, as above (§ 161, p. 124), with camphor, carbonate of ammonia, and small, or at least moderate, doses of opium. Large doses of this last medicine must be injurious in a disease, one of the chief characters of which is great depression of the vital energies.

(165.) If the means here detailed bring about reaction, the treatment must be greatly modified, or altogether changed. If it fail of obtaining this object, the additional means recommended under the treatment of the *third* form of the disease must be resorted to. (§ 187, *et seq.*)

(166.) The *second* stage, or that of reaction, being brought about, the chief intentions of treatment are—1st. To prevent it from proceeding too far; 2d. To promote the secretions, particularly those of the liver and skin; 3d. To guard internal viscera from the congestive, sub-inflammatory, and disorganizing states often attendant on this stage; and, 4th, to promote the return of the healthy functions of the alimentary canal.

(167.) The above objects are obtained by the cautious employment of blood-letting, either general or local, but more frequently the latter, in this stage of the disease, particularly if it have not previously been resorted to, or when it is clearly indicated, and when the pulse is not very soft, broad, and open,—states which forbid blood-letting; by calomel exhibited in the states of combination already noticed, or with ipecacuanha;

by the exhibition of aperients or purgatives, combined with gentle tonics and anti-spasmodies, and by the use of vapour-baths. If cerebral, typhoid, or nervous affection supervene, opium, unless in small doses, and combined with camphor, or with calomel also, seems to be contra-indicated.

(168.) In the stage of reaction attended by cerebral symptoms, particularly if the vessels of the conjunctiva be loaded, leeches should be applied to the posterior parts of the head and temples, purgative medicines employed with the view of removing the congestion of, and the determination to, the head, and of increasing all the abdominal secretions and excretions, and external derivatives resorted to, in order to relieve the internal viscera from the load which oppresses them. In this particular state of the disease, as well as in its early stage, active enemata are especially indicated. They should be repeated, without our being discouraged by the circumstance of their not being retained. Our end will be obtained at last, if we persevere in a judicious manner. I have frequently seen marked advantage derived, in analogous states of disease, from the subjoined formulæ*.

(169.) Derivatives are of the utmost advantage in the state of reaction with dangerous cerebral affection. Be-

* R. Assæfœtidæ ℥ij.

Camphoræ rasæ gr. xii.

tere cum Decoct. avenæ ℥viiij.

dein adde Olei terebinth. ℥ss ad ℥jss.

Misce, et fiat enema. vel.

R. Olei terebinth. ℥j.

— olivæ ℥jss.

Camphoræ rasæ gr. xv.

℥ Decoct. avenæ ℥viiij. M.

Fiat enema.

longing to this class of means, blisters and sinapisms have been most commonly resorted to, the former applied between the shoulders, the latter over the epigastrium; and insides of the thighs. M. RANQUE has strongly recommended certain rubefacient and irritating applications to the abdomen, and M. DE BOISMONT has approved of them. They are equally required during the first stage, particularly when the vomiting and spasms are very urgent, and during this period when the head is much affected. The subjoined* will answer the above purpose in a more efficient manner than those recommended by the French writers. The linen or leather on which they are spread should be so large as to cover the greater part of the abdomen.

(170.) Preferable to the above, in my opinion, inasmuch as its action is more quick and decided in its operation than the above, is the warm turpentine fomentation to the abdomen, already recommended (§ 162). The liniment mentioned above (§160), or the former of the two prescribed below, may

R. Camphoræ rasæ gr. xii.
 Olei juniperi Angl. ℥ss.
 Infus. valerianæ ℥x.
 Mucilag. acaciæ ℥j. M.
 Fiat enema.

* R. Emplast. aromat. (Ph. D.);
 vel, Empl. cumini, ℥ijss.
 Sulph. sublimat. ℥ss.
 Olei macis ℥xxxv. M.

Fiat emplastrum, dein asperge cum pulvere sequente :

R. Antimonii tart. ℥jss.
 Camphoræ pulveriz. ℥ss.
 Sulphur. sublim. ℥ss. M.

Et fiat epithema, vel emplastrum, super abdomen impositurum.

likewise be assiduously rubbed over the spine and lower extremities* ; the latter on the insides of the thighs only, as it is more apt to remove the cuticle than the former. When the turpentine fomentation is not used to the abdomen, the liniment may be applied to this situation.

(171.) When the stage of reaction is accompanied with gastro-enteric affection, or with the additional complication of marked affection of the liver, or disturbance of its functions, or if it assume the nearly allied form of bilious fever, the external medicaments recommended above are also requisite. If the stomach and bowels are chiefly affected, the application of leeches to the epigastrium will be necessary, previous to the employment of these, or of other external or internal means ; and emollient injections should be occasionally thrown up. Small doses of opium, combined with camphor and the blue-pill, or the hydrarg. cum cretâ, may also be given from time to time.

(172.) Very nearly the same treatment as now stated will be required when the symptoms indicate a congested

* R. Liniment. saponis co.
 ——— camphoræ co. āā ʒjss.
 Olei terebinthinæ ʒij.
 Saponis duri ʒij.
 Olei limonis et
 — cajeputi, āā ʒjss. M.

Fiat linimentum.

R. Camphoræ ʒij.

Solve in Tinct. cantharid. et

Tinct. capsici, āā ʒij.

Dein adde Liniment. sapon. co. ʒss.

et gradatim, miscendo, Liquoris ammon. ʒvj.

Olei olivæ ʒx.

Misce bene et sit linimentum.

or sub-inflammatory state of the liver. The application of leeches to the epigastrium and right hypochondrium, full doses of calomel given at bed-time, combined with small quantities of camphor, and an aperient draught the following morning, or a few hours afterwards, the use of warm diaphoretics* at short intervals, aperient and emollient injections †, and the external means recommended above (§ 160, 170), will generally be requisite.

(173.) If the consecutive affection assume a dysenteric character, leeches to the perinæum or sacrum, emollient and diaphoretic medicines ‡, and injections §, will be

* R. Camphoræ rasæ gr. iv.
Pulv. jacobī veri. gr. iij.
Opii puri. gr. ss.
Syrup. simp. q. s.

Fiant pilulæ ij, quarta vel sexta quaque hora sumendæ.

† R. Decoct. malvæ co. ℥xii.
Sodæ tartariz. ℥ss.
Olei olivæ ℥ij. M.

Fiat enema.

‡ R. Pulv. ipecacuanhæ co. gr. iv.
Camphoræ rasæ gr. iij.
Syrup. papaveris q. s. M.

Fiant pilulæ iij, quarta quaque hora sumendæ.

R. Infus. lini co. vel
— althææ co. ℥jss.
Sub-boratis sodæ ℥j.
Spirit. æther. nit. ℥ss.
Syrup. papaveris
— aurantii āā ℥ss. M.

Fiat haustus tertiis vel quartis horis capiendus.

§ R. Infus. lini comp. ℥x.
Tinct. opii ℥ss.
Sub-boratis sodæ ℥ss.
Camphoræ rasæ gr. x. M.

Fiat enema bis terve in die injiciendum.

found extremely serviceable. As the dysenteric form of the stage of reaction is frequently either associated with, or dependent upon, a very acrid and otherwise morbid state of the secretions poured into the bowels, and sometimes on affection of the liver, the occasional exhibition of a dose of calomel, with James's powder, and the use of aperients, will be indispensable, in addition to the other internal and external means of cure already particularized.

(174.) When the stage of reaction is attended with pulmonary affection, local depletion, and the exhibition of those medicines which, while they increase the secretions of the skin and the abdominal viscera, occasion a derivation of the blood from the congested organ, will be necessary. The most energetic of those are, calomel, or the blue-pill, with ipecacuanha, camphor, and hyosciamus, followed by active purgative draughts and injections, and the use to the insides of the thighs of the liniments previously prescribed. In these cases the decoction of senega, or the ammoniacum mixture, may be given with liquor ammoniæ acetatis, the camphor mixture, the spiritus ætheris nitrici, and the vinum ipecacuanhæ.

(175.) Upon the whole, the treatment of the stage of reaction in its various forms of manifestation, as well as the state of *collapse* into which it so rapidly passes, must be directed according to those sound views of morbid actions, of therapeutical indications, and of the operation and appropriate application of remedies, by which we are guided in similar or analogous cases and circumstances of disease. As to the treatment of the *last period* of the malady, or that of collapse, I will defer

offering any observations until I shall have noticed the early stages of the more severe forms of the disease.

(176.) *B. Of the treatment of the SECOND GRADE of the disease.* The same objects or intentions of cure as have been recommended for the *first* stage of the *first* grade of the malady (§ 149) will be applicable to the same stage of this; and very nearly the same agents will be required to fulfil them.

Here, also, I would venture to recommend *emetics*, and upon the same grounds, with the same views, and in the same or similar forms of combination as those already described (§ 154). Contemporaneously with the exhibition of an emetic combined with internal stimulants, I would also propose *venesection*: by it the load which oppresses the springs of life, and prevents their reaction, is lightened, and the mass to be moved is thereby brought to a nearer relation to the state of the moving power. But, while the mass to be moved is thus reduced, care must be taken to rouse the moving power, by a judicious administration of stimulants, of which full vomiting, excited by the means already noticed, owing to its action on the circulation, the application of external heat (§ 159), hot epithems and fomentations on the abdomen (§ 162), and frictions with hot liniments or warm cloths (§ 160, 170), are amongst the most efficacious. When these means fail of promoting the flow of blood, it may safely be inferred that no advantage would have been derived from the evacuation. But, with very few exceptions, blood will be procured and benefit obtained from the operation, if it be resorted to sufficiently early.

(177.) It should not, however, be overlooked that

some of the Indian practitioners, as well as several authors who have recorded their experience of the disease in Europe, have stated that cases have frequently occurred, in which, owing to the state of the patient's constitution, and to the severity of the attack, although blood could be obtained, the abstraction of the fluid has not proved so serviceable as was anticipated. In general, it may be taken for granted, that the aged, the debilitated, the previously ill-fed, the drunken, and those inhabiting low, marshy, and unwholesome situations, or who live chiefly on a poor vegetable diet, will not bear this operation: or, if at all, not nearly so well as those who are differently circumstanced.

(178.) As respects the quantity of blood that should be taken, due reference ought to be had to the effects it produces at the time of abstraction, to the habit, constitution, and previous health of the patient, as well as to the state and progress of the disease. At the same time that depletion is being instituted, as well as in cases where this measure cannot be practised, internal medicines should be administered, in addition to the external means already noticed, in order to rouse the energies of the nervous and vascular systems; and thereby, whilst the second and third intentions of cure are being fulfilled, the internal load of congestion will also be removed. Of the various internal stimuli which have been recommended—and almost every one in both the mineral and vegetable kingdoms of nature has been tried—the most eligible, and I believe the most successful, are camphor in large doses, opium, ether, the preparations of ammonia, the aromatic and essential oils, particularly the oils of peppermint, cloves, cajeput;

the spirits of mint, lavender, cardamoms, &c. ; solutions of phosphorus in ether, or in oil *; the magistery of bismuth; large doses of musk; the hot spices, and numerous warm and aromatic plants, in various forms of combination, &c.

(179.) In this state of the disease, particularly when the depression of the vital energies is extremely great, the assiduous application of the turpentine fomentation to the abdomen, as well as of the hot liniments to the insides of the thighs (§ 160, 162, 170), and the administration of injections, as stated above (§ 168), in conjunction with the internal exhibition of the stimulants now mentioned, in forms of combination suited to the circumstances of the case and the views of the practitioner, or as prescribed below†, will all be essentially requisite, and, when appropriately prescribed, will often prove highly beneficial.

* R. Phosphori gr. gr. j. ad ij.
 Æther. sulphur. ʒijj.
 Olei terebinth. ʒ ss.
 ——— olivæ ʒij ss.
 Pulv. gum. acaciæ ʒ ss.
 Aquæ menth. pip. ʒiv.
 Oleii caryoph. ʒxii.
 Syrup. zingiberis ʒj.

Misce secundum artem. Capiat cochlear. ij. larga omni bihorio.

† R. Magnes. carbon. ʒj ss.
 Spirit. æther. sulph. co.
 Tinct. cardamom. co. āā ʒ ss.
 Spirit. anisi ʒv.
 Olei carui ʒxii.
 Infus. caryoph. vel.
 Aq. menthæ piper. ʒv ss.
 Syrup. zingiberis ʒij. M.

Fiat mist. cujus capiat cochlear. iij. larga omni bihorio.

(180.) It is unnecessary to enter much further in detail as to the treatment of this stage of the second form or grade of the malady. I may, however, remark, that, in addition to the internal remedies prescribed at this place, numerous others have been recommended, and may be employed. Amongst these the most de-

R. Camphoræ rasæ ʒ ss.

Tere cum Alcoh. ʒxx.

et Magnes. sub-carb. ʒj ss.

Syrup. zingiberis ʒij.

Ammoniæ sub-carb. ʒij.

Spirit. memth. virid.

— pimentæ ā ā ʒiij.

Aquæ cinnamom. ʒvj. M.

Fiat mist. cujus capiat coch. iij. ampla omni quaque hora.

R. Infus. caryoph. ʒvij.

Tinct. serpentariæ ʒ ss.

Spirit. rosmarini

— amm. arom ā ā ʒij ss. M.

Fiat mist. cujus capiat partem quartam omni bihorio.

R. Serpentariæ rad. contus.

Contrajervæ rad. cont. ā ā ʒij ss.

Flor. arnicæ mont. ʒj ss.

Aquæ ferventis ʒx.

Macera per partem horæ quartam, dein exprime et cola.

R. Liquoris col. ʒvij.

Tinct. serpentar. ʒij.

Spirit. juniperi co. ʒ ss.

Tinct. camphoræ comp. ʒ ss.

Syrup. zingiberis ʒiij. M.

Fiat mist. cujus capiat cochlear. iij. ampla secundis horis.

R. Fol. et rad. angelicæ archang. ʒj.

Rad. serpentar. ʒij.

Flor. sambuci nig. ʒij ss.

Potassæ sub-carbon. ʒj ss.

Aquæ ferventis ʒ xii.

Macera per horam, exprime et cola.

serving of notice are, musk in large doses, with camphor or ammonia,—infusion of valerian with camphor or assafœtida, particularly as an enema,—the decoction of guaiacum, in a similar combination and mode of exhibition;—warm infusions of rosemary, mint, and lavender, with spirit of nitric æther,—and various other vegetable infusions and essential oils. I believe, however, that the exhibition of these substances by the mouth will do more harm than good, at the time that the patient is distressed by urgent thirst, and by the burning heat at the epigastrium, which generally comes on in the course of the disease. Their administration, however, as an enema, seems less objectionable.

(181.) When imperfect *reaction* occurs—for reaction is seldom or ever freely and openly developed—it presents the same manifestations, in respect of vital organs, that have been already described (§ 144, 147); and the treatment, which has been recommended as appropriate to each of the states in which this stage of imperfect reaction shows itself, is equally applicable here, and is directed to the accomplishment of the same intentions as in the first or slightest grade of the malady. The typhoid state of fever, which frequently presents itself, requires the remedies described above (§ 168); and the congestive and sub-inflammatory states of the liver (§ 171, 173), stomach, bowels (§ 171, 173), and lungs (§ 174), generally demand the means which have been explained as being applicable.

R. Liq. colati ʒvij.
 Spirit. æther. arom.
 — ammon. suc.
 — lavand. co. āā ʒij.
 Tinct. capsici ʒss. M.

Fiat mist. cujus capiat coch. iij ampla pro dosi.

to them respectively. In this stage of the grade of the disease now under consideration, as well as in the same period and form of the malady already discussed, purgatives, combined with antispasmodics and gentle tonics; calomel with camphor, ammonia, and the essential oils, &c., followed by aperients and purgative and stimulating injections (§ 168, 173), and rubefacient cataplasms and liniments, are amongst the most efficacious remedies.

(182.) It should be borne in mind that, in this stage of imperfect reaction, the object is chiefly to change the morbid condition of the circulation, by means of the secreting viscera, and by furnishing the stomach with a sufficient quantity of medicated or simple diluents, whence the inordinate loss of the serum of the blood may be replaced, and the functions of secretion supplied and promoted. At the same time that these views are being acted upon, those organs which suffer congestion and a sub-inflammatory state of action, arising from the depressed state of the vital powers and the morbid condition of the blood accumulated in or circulating through them, must be, as far as possible, preserved from disorganization. This latter object is best attained by cautious local depletions, by rousing and, at the same time, controlling the functions of the different emunctories, by expelling morbid matters from the prima via, and transferring irritation to parts which cannot be materially injured by it.

(183.) In this, and indeed in all stages of the disease, as long as the sensations of heat at the epigastrium and thirst are complained of, I would allow the patient to quench it by means of moderately *cold fluids*, in which equal parts of the super-tartrate of potass and the sub-borate of soda are dissolved. It should be recollected

that the vital energics of the frame are not only depressed, but are concentrated also towards the stomach and bowels. Cold diluents, owing to this circumstance, become extremely grateful to the patient, and have the effect of diffusing the vitality throughout the frame, and determining it from the centre to the periphery of the body. Moreover, the medicines I have recommended to be dissolved in the patient's drink have a more remarkable influence than perhaps any other in changing the viscid and thick blood to a more fluid and less viscid state, and in dissolving and removing the tenacious mucalbuminous matter, which is generated on, and adheres to, the digestive mucous surface in this disease, and which has been much insisted on by Mr. ANNESLEY, who first noticed it, and by several subsequent writers.

(184.) A weak solution of nitric acid, or of equal quantities of the nitric and muriatic acids, may also be taken as the patient's beverage, when the medicines prescribed at the time furnish no objection. Of the nitrous acid drink Mr. ANNESLEY thus expresses himself:—‘As there was so strong a predilection on the part of the patients for cold drinks, I resolved to step out of the beaten path, and gave them the nitric acid agreeably diluted; and I was gratified to find not only that no bad consequences followed, but that it was a most pleasant beverage to the patient, relieving that most distressing and urgent symptom already insisted upon, viz., the burning sensation at the stomach.’—*Sketches of the Diseases of India*, p. 174.

(185.) As soon as nature seems to be making efforts at reaction, effervescent draughts, made with the carbonate of ammonia and the pyroligneous acetous acid in mint-water or camphor mixture, with the addition of

aromatics, &c., may be given from time to time. They will be found of use in assisting the efforts of the constitution, in allaying the thirst and burning heat complained of at the stomach, in determining the circulation to the surface of the body, and in promoting the restoration of the secretions.

(186.) The "*droque amère*," a tonic aperient tincture long used amongst the Jesuit missionaries in the East, obtained much reputation in this period and grade of the pestilence, as well, indeed, as in all its grades and stages, where a stimulating aperient was indicated. Mr. ANNESLEY placed great confidence in it, and generally prescribed it. He remarks,—‘ My objects were ‘ to remove congestive symptoms, and to affect the discharge of the viscid, tenacious matter from the bowels. ‘ Bleeding, both general and local, antispasmodics, æther, ‘ ammonia, and camphor, with stimulating external applications, affected the former, and calomel with aloes ‘ the latter. I have often thought that much benefit was ‘ derived from the "*droque amère* *", in aiding the

* The composition of this tincture is as follows:—

R. Aloës socot. ꝑiv. vel ꝑv.
 Gum. myrrhæ,
 — mastiches,
 Benzoini āā. ꝑij.
 Rad. calumbæ concis.
 — gentianæ āā. ꝑij.
 Croci stigmat. ꝑj.
 Spirit. vini Gal. ꝑix.
 — vini Hollandiæ ꝑiij.

Macera per mensem, exprime et cola.

This excellent tincture furnishes an illustration of the principle, first clearly explained and inculcated by the illustrious HOFFMANN, that purgatives, particularly aloës, have their purgative action greatly increased by being combined with bitters and tonics.

‘calomel to remove this tenacious matter from the
 ‘intestines, and, therefore, I often gave it with this
 ‘medicine, in doses of from \mathfrak{z} ss. to \mathfrak{z} j. mixed with the
 ‘camphor draught,’ p. 168.

(187.) *C. Treatment of the THIRD, or most intense grade of the malady.*—In this state the depression of the energies of the frame is as profound as is consistent with the continuance of life. The means of cure, therefore, ought to be most promptly administered, and energetically devised. The objects which we propose to accomplish by them are in every respect the same as were stated when treating of the stage of depression, in the slighter grade of the disease (§ 149); but still more energetic agents are requisite to fulfil them, than have yet been recommended, and most frequently even the most active we can devise are entirely unequal to the accomplishment of the ends we wish to attain.

(188.) In this grade of the malady the stimulating *emetics* already recommended (§ 156), with the view of exciting full vomiting, which the powers of the constitution are of themselves incapable of affecting, should be employed early, with the intention of inducing reaction; and if the patient be seen by the practitioner immediately, or soon after the seizure, I think that the effect of opening a vein may be also tried; using at the same time stimulating frictions, the turpentine fomentation to the whole abdomen, as hot as it can be made; the hot-air bath, and the internal stimulants already prescribed (§ 179), or some of those about to be noticed (§ 190, 191). M. DE REIN states, that in this grade of this malady as it occurred at Warsaw, he found blood-letting of essential service, when blood could be procured, and the experience of Mr. ANNESLEY and of several other Indian

practitioners, is nearly to the same effect. M. DE BOISMONT, however, who also practised at Warsaw, as well as Dr. KEIR, and numerous other observers of the disease, both in Europe and in the East, affirm that in this very intense grade blood-letting is of doubtful advantage, and even seems, on some occasions, hurtful. Dr. MOUAT states that blood-letting, which had been generally beneficial during former years of the prevalence of the pestilence, was injurious in the cases which occurred in 1828, even amongst Europeans, rapidly reducing their already depressed vital energies.

(189.) M. DE BOISMONT mentions that after the disastrous battle of Ostrolenka, the pestilential cholera assumed, owing to the general depression of spirits which prevailed, a severer grade, and both vomiting and purging were entirely wanting in the worst cases. The surface of the body presented a blackish hue, was covered with a copious cold sweat, and death took place, in spite of every means that could be devised, in three or four hours. In these cases blood-letting seems to have been either not employed, or not sufficiently assisted by other means, and consequently the experience of its propriety was unsatisfactory in every respect. M. DE BOISMONT, as well as Dr. IANIKOWSKI, recommend it in such cases only when the patient is plethoric; whilst the experience of M. LE BRUN and M. ENOCH, physicians at Warsaw, is in favour of it, even in the worst cases, if blood can be possibly obtained.

(190.) After endeavouring to excite full vomiting, and to procure blood, particularly when the early period of the attack, and the circumstances of the patient furnish rational expectations of advantage from them,

I would resort to still more energetic means than have hitherto been employed. These are very nearly the same as were made public by me in the *Foreign Quarterly Review*, for October, 1831, and in the *Medical Gazette* for the 19th of November of that year. When approved means fail, others, which have succeeded in similar states of morbid action, particularly when they cannot prove detrimental, should be prescribed. I would next recommend the patient to have a bolus consisting of from ten to fifteen grains of camphor, an equal number of grains of calomel, one grain of opium, and ten drops of any essential oil, as of mint, eajeput, &c. with a sufficient quantity of conserve of roses. This should be administered after full vomiting, if it can be quickly procured, but without any regard to its continuance. If this be retained, another may be given, and repeated in from one to two, three, or four hours, according to the urgency of the attack; but if rejected, it should be immediately repeated, until it at last remains. Not more than three or four of those boluses ought to be given, and frequently two will be sufficient.

(191.) Simultaneously with the administration of the above, dry heat ought to be employed, and the turpentine fomentation should be applied, as hot as possible, to the abdomen and chest, and friction of the spine and thighs with any of the liniments prescribed above (§ 160, 170), made warm by plunging the vessel containing it in hot water, resorted to. From one to three hours after the exhibition of the bolus, a draught, consisting of from two drachms to half an ounce each of spirits of turpentine and castor oil, or of olive oil, with a few drops of the above essential oils, and forty grains of magnesia,

should be taken in mint water; and if it be rejected from the stomach, another should be given, and repeated, if again rejected, in half-an-hour afterwards; if retained, not until from six to twelve hours, when another may be taken. I have seen cases where the most urgent vomiting existed; and yet the above remedies (although both the bolus and the draught were taken at the same time) allayed, instead of aggravating, this symptom. Besides, it is our object to obtain full vomiting at first; therefore this cannot be viewed as an unfavourable operation of the medicine, if it should follow the exhibition of the first doses of it. In order to promote the influence of these means, a lavement, consisting of twenty grains of camphor, from half an ounce to an ounce and a half of the spirits of turpentine, and an equal quantity of olive oil, in a suitable vehicle, should be administered, and repeated according to the circumstances of the case. Much will depend upon the succession in which these remedies are given, the periods which are allowed to elapse between their exhibition, on the doses, and the decision with which they are prescribed. The hot turpentine fomentation, assisted by hot air and frictions with stimulating substances, is the most powerful means I am acquainted with of procuring reaction, restoring the heat of the body, and relieving the viscera from congestion.

(192.) The internal remedies now recommended, as well as the external means so frequently insisted upon, have been employed by me in many hundred instances of malignant and extremely dangerous diseases, and I have found them the most efficient of all others with which I am acquainted, when judiciously combined and administered, in rousing the energies of life, restoring

the secretions, removing the congestion of internal organs, and in subduing that unhealthy sub-inflammatory state of action, which often occurs in fevers, and in diseases proceeding from infection and animal poisons, and which generally advances rapidly to fatal disorganization. In aid of the above remedies, and particularly when the energies of the constitution seem to react, although most imperfectly, *effervescent draughts* with the carbonate of ammonia, and the pyroligneous acetous acid in mint water, or in an infusion of cloves, may be given from time to time, and a *large blister* applied over the epigastrium upon the removal of the turpentine epithems.

(193.) Before proceeding further, I would also recommend, both in this most severe grade of the malady, and that next it in degree, the administration of medicinal substances in the state of vapour, and medicated gases through the channel of the respiratory organs. I have already argued, and I may add, shown, that it is through these organs that the specific cause of the disease invades the frame, and that they suffer in a most remarkable manner from its impression, having their functions altogether paralyzed. If this view be entertained, the means of individual prevention which I have recommended will appear the more deserving of adoption, and the directing of medicinal agents to this quarter will, at least, not be considered unreasonable or undeserving a fair trial. Perhaps the inhalation of the nitrous oxide gas, or common air with a slight addition of oxygen, will be the most energetic remedies that can be employed in this way. Other means, also, which will readily suggest themselves to the well-informed physician, may be employed; and amongst others the

vapour of the sulphuret of iodine, the tincture of iodine, or of iodine itself, or chlorine gas, or the vapour arising from gently heating a strong solution of camphor in aromatic vinegar, or the vapour of the aromatic preparations of ammonia may be mentioned; and shocks of galvanic electricity may be passed through the chest.

(194.) Besides the use of frictions with hot cloths, or dry substances, or with liniments, which will not occasion cold by their evaporation—means which have already been advised, the application of hot air, or of hot bricks, hot sand, or salt, or bran, or hot oats around the body have all been recommended. In cases where the hot turpentine fomentation, or common sinapisms, have no effect; or in this most intense grade of the malady, without waiting for the effects of less active means, the subjoined cataplasm * may be applied over the abdomen. A trial may also be given to medicated vapour-baths; to baths, with the fumes of some of the volatile essential oils extricated by heat; and to cupping in the course of the spine, with the view of removing the congestion within the spinal canal, as well as in

* R. Pulv. sinapeos ℥ss. .
 — capsici amni.
 — zingiberis āā ʒj.

Acidi acetici pyrolignei q. s. ut fiat cataplasma,
 dein adde Olei terebinthinæ, ʒij. Misce.

The following compound tincture of camphor and opium seems well suited to the worst grades of this malady, in doses of from two drachms to half an ounce, given in any suitable vehicle.

R. Opii pulveriz. ʒij.
 Camphoræ ʒvj.
 Corticis canellæ contus.
 Croci stigmat. ʒij.
 Caryophyllorum

other parts. In general, it may be remarked of the use of remedies in this disease, that in its most severe attacks, or when far advanced before medical aid is procured, scarcely any means, however well and energetically devised and practised, will arrest its fatal tendency; whilst the less severe visitations will generally be removed by any of the remedies enumerated, when judiciously combined and employed. There is reason to suppose that the slightest manifestations of the malady will even, by means of the vomiting and tumult excited in the frame, operate their own cure; and hence the reputation acquired by various mild or inefficient medicines and methods of treatment. There are few diseases, perhaps, which, while they preserve a perfect identity of character, present a greater range in grade than this; excepting, indeed, those maladies which propagate themselves in a similar manner to it. We conceive, therefore, that it is chiefly to the mildness of the attack that we are to attribute the imputed success of such remedies as successive draughts of warm milk, olive oil, the Glauber's salts, common salt, and various other mild preparations. In the more intense visitations of the malady, where the depression of the vital energies of the frame, and the vitiation of the blood are extreme, remedial agents must possess a co-ordinate degree of

Pulv. capsici, ʒjss.

Potassæ sub-carbon. ʒij.

Olei anisi, ʒj.

Spirit. vini tenuior. (vel

Sp. vin. gallicæ, vel sp. vin.

Hollandiæ)——Oij.

Macera leni cum calore, per dies viij. ad xii. dein exprime et cola.

activity, in order to produce any effect whatever on the system.

(195.) If the above energetic means be judiciously put in practice, and brought to act simultaneously on different parts of the body, or prescribed in due succession and states of combination, as the scientific, zealous, and experienced practitioner may consider appropriate to the grade and stage of the malady, signs of re-action will often manifest themselves; when—particularly if it have not previously been employed, or when the state and circumstances of the patient furnish no reason against it, blood-letting, either general or local, may be cautiously resorted to. If the stage of reaction be brought about, however imperfectly, the same intentions of cure, and the same measures to fulfil them, which I have already described when treating of the various manifestations of this stage in the less intense grades of the malady, must be appropriately employed against each of them respectively, as they may supervene in this most severe form of the pestilence.

(196.) As the exhaustion of strength in this malady is extreme, and as every muscular effort increases it, and as fatal syncope may soon occur in the most severe grades, from being raised to the erect, or even the sitting posture, means ought to be adopted to preclude the necessity of the patients' removal from the recumbent position for the purposes of evacuation. The discharges should be received in a bed-pan; and when medicines are exhibited, his head and shoulders should be raised no higher than is requisite to the accomplishment of the object. Mr. SEARLE very justly remarks, that attention to this injunction cannot be too strictly

enforced, and states, that two patients under his own observation lost their lives from neglecting it.

(197.) It not unfrequently happens, that the active stimulants which we prescribed in the stage of depression, particularly in the more intense grades of the malady, together with the natural tendency of the disease, occasion inflammation, or a sub-inflammatory state of the stomach and bowels. When this occurs, the epigastrium and abdomen become extremely tender, and even much more tumid than ordinary. Great irritability of the stomach is also present, and is increased after the ingestion of stimulating substances. In cases of this kind, venesection, the application of leeches, followed by the hot fomentation or the cataplasm prescribed above (§ 162, 194.), and, upon their removal, by a large blister; the exhibition of calomel combined with small doses of camphor and opium; purgative or aperient injections, often repeated, and sinapisms or stimulating liniments to the lower extremities, are amongst the chief remedies that can be employed.

(198.) Besides the means of cure which have been adduced, I may notice *those which have been employed or recommended by various experienced writers.*

M. BENOIT states, that he found the combination of camphor, laudanum, and sulphuric æther, with the external use of sinapisms to the epigastrium and extremities—means already noticed and employed by numerous practitioners, extremely successful in the visitation of the pestilence at Manilla, in 1820. Mr. CRAW (*Bombay Reports*) speaks very favourably of large doses of ammonia and musk. Dr. PEITSCH (*Fodèré*, p. 261) states that his practice in Java showed the uncommon efficacy

of two parts of spirits of mint, one part of spirit of lavender, and one of laudanum, taken in doses of a spoonful, until the vomiting ceased. Mr. MILWARD (*Bomb. Rep.*) informs us that he found magnesia, in doses of four scruples, remain on the stomach and procure natural evacuations, other means having failed. Dr. MAHIR, of the Polish army, employed large doses of opium and prussic acid, with lavements of assafœtida. Several physicians in Russia, Poland, and Germany, have had recourse to moxas, or the actual cautery applied either along the spine, or on the scrobiculus cordis. Many of the physicians at Warsaw ascribed good effects to the magistery of bismuth, whilst others stated it to be more injurious than beneficial.

(199.) The treatment which was recommended by Mr. CORBYN, and very generally adopted in India, where it was followed by several other writers, consisted in from fifteen to twenty grains of calomel, washed down with sixty drops of laudanum, and twenty drops of the oil of peppermint, in two ounces of water. He adopted full blood-letting in Europeans, and repeated the above medicines every three hours, until relief was obtained. The use of the oils of peppermint and cajeput was very general in India, and they seem to have been frequently extremely serviceable, but as adjuvants merely.

(200.) Mr. ANNESLEY confided in blood-letting employed early in the disease, and in large doses of calomel, with moderate quantities of opium, followed by warm stimulating purgatives. His object in prescribing the free use of these medicines was to remove the tenacious muco-albuminous matter lining the internal surface of the intestines, and almost obstructing the canal.

(201.) Mr. SEARLE advises that the patient should be placed between very warm blankets in an airy apartment; and that, as he considers a deranged state of the stomach is generally connected with the origin of the attack, the full evacuation of this organ should be amongst the earliest intentions to be fulfilled. For this purpose he recommends, whether the patient has vomited or not, that he should drink freely of warm water in which common salt has been dissolved,—about a table spoonful of the salt to half a pint of hot water; that bleeding should be practised, and, after the stomach is evacuated, that a full dose—about twelve grains—of calomel, be exhibited, and washed down with hot brandy and water, and that this be repeated every hour or two, until an improvement is observed, when it may be given in smaller doses, and either in conjunction, or alternately, with some mild aperient. For the sub-inflammatory states of the encephalon, or abdominal viscera, frequently supervening during the second stage of the malady, he recommends the employment of moderate, general, and local depletion, with injections and counter-irritation, by means of sinapisms. He found the cramps relieved by compression. Ligatures may be applied to ease this symptom, and frictions with the liniments prescribed above (§ 160, 170).

(202.) Mr. Goss, of the East India Company's service, states, that hearing the patients complaining of the excoriating nature of the fluids evacuated, he suspected this property to depend upon the presence of some acid, and that he therefore exhibited about a drachm of the carbonate of soda with fifteen grains of the carbonate of ammonia; the patients, who were very few, and their cases slight, all recovering under this mode of treatment.

He likewise had recourse to full blood-letting, occasional doses of calomel and jalap, to frictions and counter-irritants applied to the abdomen and lower extremities. He states that emetics had failed in some instances in which he had employed them, but had succeeded in others. He appears to have employed the ipecacuanha powder merely, without combining it with diffusible stimuli, and therefore his failure with them in the most severe cases was to be expected.

(203.) Dr. RAIMANN, of St. Petersburg, states, that blood-letting, with calomel and opium, and external heat and irritation, were amongst the most successful means employed against the disease in Russia. Warm baths were of equivocal service, unless at the very commencement of the seizure, or in the slightest cases. They generally exhausted the patient instead of restoring the circulation to the surface in the more severe cases.

(204.) M. Vos, who practised in Batavia, found blood-letting of service amongst Europeans only: it was injurious in the natives. The remedies from which he derived the greatest advantage, were calomel with opium, followed some time afterwards by warm stomachic purgatives and injections.

(205.) M. MARGEOT, who observed the disease in the Isle of France, prescribed, every two hours, two drachms of the sulphate of soda in a glass of honey-water, until bilious evacuations appeared. He gave diluents liberally, and administered emollient injections frequently, with the view of promoting the action of this salt. M. ROBERT, who adopted this practice, added to it the occasional exhibition of a draught with ammonia; and M. GALDEMAR employed a draught with olive oil, sulphuric ether, and camphor.

(206.) Mr. BOYLE, who treated the disease in India soon after its first appearance, finding, in the post mortem examinations which he first made, that the gall-ducts were obstructed by a thick viscid bile rather than by spasm, was led to exhibit emetics and procure full vomiting, in order to remove this obstruction of the passage of bile to the duodenum ; and the advantages which he obtained from the practice induced him to recommend it in preference to other means which he considered subordinate to it, and requiring to be varied according to the circumstances of individual cases, the use of emetics being always requisite. To this gentleman the credit is clearly due of having been the first to recommend the use of emetics in this disease.

(207.) Several of the American practitioners who had visited India and China during the prevalence of the pestilence, prescribed powdered carbon and burned cork in milk, and conceived that benefit resulted from the practice. I believe that this substance, as well as many others to which a certain degree of credit is attached, only seemed of advantage, it being apparently successful in the slighter cases of the disease, in which the morbid actions induced in the frame operated their own cure, through the aid of the powers of the constitution. This practice, however, was strongly recommended by Dr. JACKSON, an authority of the greatest weight, in dysentery and chronic diarrhoeas, in which affections it appears to have been extremely serviceable.

(208.) When the disease appeared in Persia, the native practitioners had recourse to cold affusions, and cold, acidulous, or iced fluids, of which the patients were allowed to drink at will. At Bussorah, M. MORANDO prescribed cold applications over the organs chiefly

affected, at the commencement of the attack, and blood-letting, both general and local. M. MEUNIER, at Bagdad, treated the disease by means of venesection, leeches applied to the pit of the stomach, mucilaginous and opiated draughts and injections, and hot fomentations. A similar practice to this seems to have been very generally adopted by medical men in Syria, Mesopotamia, and Aleppo. As to the effects, good or bad, of the cold affusion as adopted in Persia, I can find no precise information. But, judging from the great benefit I have seen experienced from the cold affusion on the head, in cases of poisoning from opium, even when life, apparently, is nearly extinct, this practice seems to me not so irrational as many may suppose. It is at least one of the most energetic means with which I am acquainted of removing congestion of the vessels within the head. The tepid affusion to the head likewise promises some advantages.

(209.) When the disease appeared at Astrachan, in 1823, the medical commission prescribed the following practice:—A large blood-letting; a dose of calomel, with sugar or gum Arabic, and followed by from forty to sixty drops of laudanum; twenty drops of the oil of peppermint, given in two ounces of the aqua melissæ; frictions of the epigastrium, with an ammoniaical liniment; scarification and cupping over the abdomen; frictions of the limbs and surface generally with camphorated spirit; mucilaginous injections with about thirty drops of the tincture of opium, and calomel in doses of from ten to twenty grains. This practice, which was altogether based on that very generally employed in India, was likewise employed when the disease invaded Russia in 1830; but on this occasion blood-

letting was found less beneficial than formerly, and warm sudorifics, and the external application of warm heat, were more depended upon.

(210.) Dr. KEIR, who had great experience of the disease at Moscow, derived advantage from blood-letting in the young, plethoric, and well-fed, and in the common or intermediate grades of the malady, particularly when employed early, or before the pulse left the wrist. In the most intense grade, or when resorted to late, or when the pulse had disappeared from the arm, it often seemed prejudicial. Full doses of calomel with opium, followed by stimulants, purgatives, and injections, and accompanied by the external and other means usually employed by the Indian practitioners, formed the principal part of the treatment adopted by him.

(211.) When the pestilence appeared in Warsaw, the medical authorities there had recourse to very nearly the same treatment as stated in the preceding paragraph (§ 210). Subsequently, many adopted, and several afterwards relinquished, the plan of Dr. LEO, which was to give three or four grains of the sub-nitrate of bismuth every two hours. According to M. BOISSEAU, the hydrocyanic acid, the hydrocyanate of zinc, oxygenated water, and oxygen gas, were all tried in this city without benefit; and, I may add, that laurcl-water, phosphorus, both internally and externally, moxas, and the actual cautery to the spine and epigastrium, were also made trial of without any remarkable advantage. M. BRIERE DE BOISMONT recommended (when vomiting continued urgent) the cuticle to be removed by means of liquid ammonia, and the denuded surface to be sprinkled with one or two grains of the acetate of morphia.

(212.) The late Mr. FINLAYSON derived advantage in

one case in Ceylon, from passing a galvanic current through the lungs. Galvanism is certainly most deserving a fair trial in this disease. I understand, at the moment this is passing through the press, that a galvanic battery has been directed to be sent to Sunderland. I recollect, several years since, of having discussed the chances of success from this agent with my friend, Mr. ANNESLEY, the able writer on this malady.

(213.) Dr. BARRY, having very frequently observed congestion, inflammation, and softening of the spinal marrow, in a greater or lesser degree, in his examination of fatal cases of the pestilence, has been led to recommend the application of the actual cautery to the back, opposite the lower dorsal and upper lumbar vertebræ; it had been employed on the Continent with considerable success. He also advises full vomiting, and for this purpose prefers a strong solution of common salt and water, given in doses of six ounces. Warm, dry applications to the skin, and continued friction, he considers very beneficial, whilst vapour and hot-water baths he believes to be worse than useless. Bleeding, as well as large doses of either opium or stimulating liquors, seem dangerous in the utmost state of depression, when the powers of life are reduced to the lowest ebb, and consequently easily annihilated; but previous to this state, or when reaction is supervening, he conceives that blood-letting will be beneficial to the patient. Might not scarifications and cupping, or dry cupping, in the course of the spine, prove of advantage?

(214.) The following account of the experience of several physicians at Warsaw, abridged from that given by M. DE BOISMONT, is important, as illustrating the success of different kinds of practice:—

Dr. JANIKOWSKI treated sixty-six cases. He bled the robust and those with evident congestion, and gave every three hours two grains of calomel, with one of opium, with warm stimulating diluents, sinapisms on the epigastrium, and frictions of the limbs with irritating liniments. In some cases he gave the nuxvomica in doses of half a grain, every fourth hour, in an emollient decoction, and, he conceived, with some advantage. He lost twenty, chiefly old persons, of the number treated.

(215.) Dr. KOEHLER had sometimes recourse to blood-letting, but depended more upon the preparations of ammonia. He also prescribed calomel with opium, and in some cases large doses of the sub-carbonate of potash. The further results of his experience are not given.

(216.) M. LE BRUN treated about sixty cases, of which he lost nearly one-half. The disease was, however, far advanced before they came under treatment. He confided chiefly in blood-letting, warm diluents with opium, and camphor combined with calomel. Of twenty cases treated in private practice, five died. The remaining forty were hospital cases.

Dr. ENOCH treated forty-three cases, of which five were hospital patients. He lost only seven cases, chiefly aged persons. The most of his patients were bled, and treated with calomel and opium at first, and afterwards with calomel and rhubarb. He directed sinapisms to the epigastrium and extremities.

(217.) Dr. JASINSKI treated thirty cases, of which ten died. In his earliest cases he employed blood-letting when he thought it indicated, or leeches to the painful part of the epigastrium, with small doses of

calomel and opium, and the infusion of valerian. In the cases which occurred subsequently, and which were generally more intense, he prescribed leeches to the abdomen, the magistery of bismuth internally, and sinapisms and frictions to the extremities.

(218.) Dr. KACZKOWSKI, physician-in-chief to the Polish armies, had recourse in the most severe cases to large blood-lettings, to calomel in doses of three or four grains, with half a grain of opium, every two hours, with the external use of sinapisms, stimulating cataplasms, moxas, &c. He also frequently prescribed, every two hours, small quantities of Dover's powder with mint ptisans, and large doses of magnesia; and states that he derived advantage from the nux vomica, given with the mucilage of gum Arabic and sugar or syrup. He lost one-sixth of his patients, amongst whom, however, he seems to have included several cases which evidently did not belong to this disease.

(219.) *C. Treatment of the disease in the last stage, or that of exhaustion or collapse.*—In those cases of the disease in which efforts at reaction, or consecutive excitement, are manifested, exhaustion often rapidly supervenes, owing to the depressed and weak powers of life, and the morbid state of the circulating fluid. Hence the necessity, even during the imperfect manifestation of excitement or reaction, to support the powers of life, while we have recourse to small general or local depletions, and act upon the secretions by means of purgatives given by the mouth, and in the form of injections: hence the propriety of removing the local determinations and congestions with which the attempts at reaction are more or less accompanied, by means of external derivatives and counter-irritants employed at

the same time that we endeavour to restore the suspended secretions, and thereby to purify the blood and create a salutary derivation of the circulating fluid from the seats of congestion and oppression.

(220.) As, however, attempts at reaction, whether fully accomplished or entirely abortive, must necessarily soon lapse into profound exhaustion, when arising out of inordinate depression of the powers of life and an impure state of the blood, inasmuch as this fluid, owing to its morbid condition, is incapable of exciting the vital energy of the organic or ganglionic nerves, and of preserving the powers of the brain, we should, therefore, be prepared to meet with sudden collapse, and to anticipate its occurrence. The chief object we can entertain is to remove, through the medium of the secreting viscera, as quickly as possible, and by as energetic means as we are possessed of, the impurities existing in the blood. We should, therefore, resort as early in the disease as circumstances will permit, to the exhibition of those substances which are the best calculated to attain this object. Calomel alone, or combined with ipecacuanha and aloes, and followed by the compound decoction of aloes, and aperient injections; or calomel in full doses, followed by castor oil, or by the compound infusions of gentian and senna, with compound tincture of aloes and spirit of ammonia, and the occasional administration of some one of the enemata prescribed above (§ 168, 173, 190), or of one consisting of a solution of common salt in water gruel, are, upon the whole, among the best means of this description that we can employ.

(221.) If, notwithstanding the use of these means, exhaustion proceeds rapidly, stimulants and permanent

tonics, given internally, antispasmodic and tonic injections, hot air, hot cataplasms and fomentations, and the other internal (§ 179, 190, 191) and external stimulants, described when treating of extreme depression, occurring early in the disease (§ 160, 162, 170), must be resorted to. At the same time it should be kept in mind, that, however great the depression may be, it will never be removed without administering purgatives and aperient enemata, as long as the evacuations and secretions remain offensive and morbid in their appearance; but the purgatives employed should, in these circumstances of disease, either be of a tonic nature, or combined with warm tonics and aromatics. It is in this state of the disease that the warm tonic and purgative tincture prescribed above (§ 186) proves most serviceable, and that the patient requires to have his energies kept up by slight nourishment, and a moderate quantity of wine, which latter may also be administered occasionally with injections.

(222.) In the more extreme cases of this stage of the disease, I would recommend some one of the aromatic oils, as that of cloves, or of mace, or of rosemary, or of British juniper, of rue, or lavender, to be applied warm, over the abdomen or epigastric region, and allowed to remain there, or to be renewed, according to the effect produced. In the more urgent cases, a cloth moistened with the warm oil may be placed in this situation, and kept closely applied by means of a compress laid over it, which will tend to prevent its rapid dissipation. In milder cases it may be combined with camphor and some one of the plasters in common use, as the galbanum, the pitch, or ammoniacal plaster, and these applied and renewed from time to time.

(223.) *D. During convalescence* from this disease, care should be taken to prevent relapses. It is very frequently observed, that at the commencement of convalescence, the patient is tormented with an uncommon craving for food. This should be restrained, and but little, or at most a moderate quantity only, and of a light, digestible kind, allowed to be taken. The severe nature of the attack, the derangement of the digestive mucous surface, and the disturbance accompanying it, of all the digestive organs, must necessarily leave them for a time incapable of discharging their functions in a regular or active manner. They should therefore have no more imposed upon them than they seem capable of performing.

(224.) It frequently happens that, owing to neglect of this precaution, and occasionally to too early exposure to the vicissitudes of season or of weather, or to cold, chills, or wet, after an attack of this malady, a relapse occurs, and frequently carries off the patient. Care, therefore, should be taken to protect the surface of the body, and particularly the extremities, from cold during convalescence,—to regulate the diet and regimen of the patient,—and to promote the return of the healthy action of the stomach, bowels, and secreting viscera. In order to accomplish this last object, gentle tonics will be necessary; and as the functions of the bowels generally require aid, this should be afforded by combining aperients with tonics*, and by gradually increasing the quantity and nutritious quality of the food.

* R. Pilul. hydrarg. ℞j.

— aloës cum myrrha ℥ss.

Saponis castil. gr. x.

Fiant pilulæ xii. quarum capiat binas alternis noctibus.

(225.) After the frame has been fortified to a certain extent by these means, and the functions of the bowels and the secretions brought to a healthy state, the shower-bath, or the salt-water bath, may be employed, in order to bring about a complete restoration of the energies of the constitution. Whichever of the two kinds of bathing be adopted, active friction of the surface of the body should follow upon coming out of the bath, and moderate exercise be taken in the open air, either on foot or on horseback.

R. Quininæ sulph. ℥j.
 Pilul. aloës cum myrrha,
 Extr. gentianæ, āā ℥ss.
 Pulv. capsici ℥j.
 Olei caryoph. q. s.

Fiat massa æqualis et divide in pilulas xxx, quarum capiat binas omni meridie; vel

R. Infus. gentianæ co.
 — sennæ comp. āā ℥iij.
 Potassæ sub-carb. ℥j.
 Tinct. cardam. co. ℥ss. M.

Fiat mist. cujus capiat cochlear. iij. vel iv. ampla, hora somni vel primo mane.

A P P E N D I X.

I.

SANITARY HINTS RESPECTING CHOLERA, ISSUED BY THE CENTRAL BOARD OF HEALTH, LONDON.

Council Office, Whitehall, 14th Nov. 1831.

SIR,

THE Central Board of Health having maturely weighed all the information which has been transmitted to them relative to the progress of the Asiatic spasmodic cholera in various parts of Europe, but more particularly guided by the conclusions, on this head, to which Drs. Russell and Barry have arrived after a five months' careful and laborious observation of the character of that disease in those parts of Russia which they have visited, beg leave to suggest for your consideration the following sanitary hints:—

I.—*As to Precautionary Measures.*

In order to ensure the adoption and realize the benefit of any system of sanitary arrangements in a large community, the first essential point is to divide that community into subordinate sections, and to form district Boards of Health, each to consist, if possible, of a resident clergyman and a number of substantial householders, and of one medical man at least.

These Boards should be charged with the following duties in their respective districts, viz. :—

1st, To appoint inspectors. Each inspector to visit daily, and to inquire carefully after the health, means of subsistence, cleanliness, and comfort, of the inmates of, say, 100 houses, more or less, according to local circumstances.

2dly, To receive and examine the reports of these inspectors, which should be made up to a given hour on each day.

3dly, To endeavour to remedy, by every means which individual and public charitable exertion can supply, such deficiency as may be found to exist in their respective districts in the following primary elements of public health, viz., the food of the poor, clothing, bedding, ventilation, space, cleanliness, outlets for domestic filth, habits of temperance, prevention of panic.

4thly, To report to their principal Boards respectively on the above heads, as well as on the actual state of health of their districts.

The subordinate divisions of each district ought to be numbered or lettered, and each district named; the names of the members of each Board, or of the medical men attached to each, and of the visiting inspectors employed, should be placarded in conspicuous places.

Principal Boards of cities, towns, or parishes, to report directly to the Central Board in London :—

1st, On the actual state of health of their whole population.

2dly, On the precautionary measures already carried into effect.

3dly, On the measures contemplated.

4thly, On suspected sources, if any there be, from whence this particular disease might possibly spring.

With regard to precautions as to intercourse with suspected or really infected persons or places, the Board are confident that good sense and good feeling will not only point out, but morally establish, as far as may be practicable, the necessity of avoiding such communication as may endanger the lives of thousands.

But they strongly deprecate all measures of coercion for this purpose, which, when tried upon the Continent, invariably have been productive of evil. The best induce-

ments to a prompt acknowledgment of the disease having entered a family, as well as to an early and voluntary separation of the sick from the healthy, will always be found in the readiness and efficiency with which public charitable institutions attend to the objects noticed in Sec. 3.

It is with much satisfaction that the Board feel themselves authorized to declare, and it will no doubt be highly consolatory to the public to learn, that under proper observances of cleanliness and ventilation, this disease seldom spreads in families, and rarely passes to those about the sick, under such favourable circumstances, unless they happen to be particularly predisposed.

It will not, therefore, be necessary, where there is space, and where due attention is paid to cleanliness and purity of air, to separate members of families actually affected by the disease, nor to insulate individual houses, unless in cases of crowded, filthy, badly-ventilated habitations, and other contingencies, which involve the health and safety of all.

It having been proved, by ample experience, in more than one city in Europe, that the fitting up and furnishing of hospitals for the reception of the poorer classes supposed likely to be attacked by the disease, at a period too long before its actual breaking out, has been productive of great waste of means, by the spoiling of various articles, and the consequent want of wholesome accommodation when most required, the Central Board would recommend that proper and sufficient house-room only be secured and prepared in the first instance, and that the charitable be called upon only to pledge themselves to furnish, at a given notice, such articles of bedding, furniture, &c., or the value of them, as they would have at once contributed.

By this means the deterioration of perishable articles will be avoided, and should the district entirely escape, the contribution will be saved.

The situation which the Board would recommend for temporary cholera hospitals would be, those most detached, insulated, and thoroughly exposed to free and open air; the

description of house, such as would admit of the most perfect ventilation and cleanliness, and the largest space around the sick.

The Board would recommend, when a family is reported to be in an unhealthy state by the sub-inspector, and the disease confirmed to be cholera by a medical member of the District Board, that the head of such family, if unable to afford proper accommodation at home, be advised to send the sick person forthwith to the temporary hospital, and that the other members of the family be supplied with such additional means and comforts as their state may require to enable them to resist the influence of the infected atmosphere in which they live.

II.—*Medical and Dietetic Precautions.*

These will be found of considerable importance, from their contributing to prevent or diminish the susceptibility to infection which individuals may possess at the moment the disease breaks out.

No sudden nor extensive alterations should be made in the usual modes of living. All changes of food, to be useful, indeed not to be absolutely prejudicial, should tend to render it drier, more nutritive, and concentrated; moderately costive bowels, the almost invariable consequence of a dry, invigorating diet, will be found more conducive to exemption from cholera than an opposite habit.

Whenever aperients may become indispensable, those of a warm aromatic kind, in moderate doses, or domestic means, should alone be resorted to.

What is generally understood by salts, viz.—Glauber's salts and Epsom salts, as well as other cold purgatives, should not be taken in any quantities, nor on any account without the express prescription of a medical man.

The medical members of the Board beg to state, in the most decided manner, that no specific preventive against cholera is known to exist, and that the drugs hitherto offered with this pretension, in countries where the greatest

ravages have been caused by this disease, not only did not possess the negative virtue of doing no harm, but were found to be absolutely injurious.

The true preventives are a healthy body, and a cheerful, unruffled mind. Looseness of bowels should be immediately checked, and anything like periodical chills or cold perspirations should be met by quinine in suitable doses ; but habitual drugging, at all times improper, is to be deprecated in the strongest terms when epidemic disease is apprehended.

The Board has been anxious to lay before the public, as early as possible, the above precautionary outlines, which they trust will tend, together with the suggestions emanating from the wisdom and observation of your and other local Boards, if not to exempt the whole population of these realms from the scourge of spasmodic cholera, at least to enable them to meet it, in the event of its appearing amongst them, with physical and moral constitutions the least likely to suffer from its virulence.

The Central Board will avail themselves of the earliest opportunity to transmit to you any further sanitary suggestions which may occur to them on the subject of precautionary measures, as well as an outline of instructions now in preparation for communities supposed to be actually attacked.

I have the honour to be, Sir,

Your most obedient servant,

E. STEWART, Chairman.

II.

DIRECTIONS FOR EMPLOYING THE CONCENTRATED SOLUTION OF THE CHLORIDE OR CHLORURET OF LIME, FOR THE PURPOSE OF DISINFECTION.

DILUTE one part of the concentrated solution with fifteen parts of cold water, and stir the mixture for a few minutes.

Place an open earthen vessel, containing a quart of the diluted solution, in the current of air entering the room or place to be disinfected, and pour into it a wine-glassful of the hydrochloric acid: perfect purification will very speedily take place. In about an hour fresh air should be admitted as freely as possible. If clothes supposed to be infected are suspended in the room during this process, they will be readily purified.

To disinfect rooms in which sick persons are confined (who would be incommoded by the above rapid mode of purification), wet a linen cloth with the diluted solution, and suspend it in the place to be disinfected: it will require renewal two or three times a day. Night-chairs, or any vessels in which putrid animal or vegetable matter has been kept, will be immediately disinfected by rinsing them with the diluted solution; a small quantity of which may afterwards be allowed to remain in them whilst in use.

To disinfect drains, sewers, and water-closets, a quantity of clean water should first be thrown down them, and afterwards one or two gallons of the above diluted solution.

Contaminated stables may readily be disinfected by washing the walls, mangers, &c. with the solution diluted with thirty parts of water, and afterwards rinsing with pure water.

The Author is indebted to Mr. Morson, of Southampton Row, for the above directions.

Labarraque's Disinfecting Fluid, or solution of the chloruret of soda, has been long used by the Author for the purification of the air of infected wards and apartments. He has generally directed it to be sprinkled in the floors, or a cloth wetted with it to be suspended in the room.

III.

LIST OF WORKS ON THE PESTILENTIAL
CHOLERA, WHICH HAVE COME
BEFORE THE AUTHOR.

- Reports on the Epidemic Cholera which has raged throughout Hindostan and the Peninsula of India, since August 1817. Published by the Authority of Government. Bombay. 8vo. 1819.
- Report on the Epidemic Cholera Morbus, as it visited the Territories subject to the Presidency of Bengal, in the years 1817, 1818, and 1819. Drawn up by order of the Government, under the Superintendence of the Medical Board. By JAMES JAMESON, Assistant Surgeon, and Secretary to the Board. Calcutta. 8vo. 1820.
- Report on the Epidemic Cholera, as it has appeared in the Territories subject to the Presidency of Fort St. George. Drawn up by order of the Government, under the Superintendence of the Medical Board. By WILLIAM SCOT, Surgeon, and Sec. to the Board. Madras. Folio. 1824.
- Extracts from Original Reports of Medical Officers on the Epidemic Cholera, addressed to the Medical Board. *Ibid.*
- Account of the Spasmodic Cholera which has lately prevailed in India and adjacent Countries and Islands, &c. In a Letter to Sir Gil. Blane, from Mr. CORBYN. Medico-Chirurgical Transactions, Vol. xi., Part I. 1820.
- An Essay on the Epidemic Cholera of India. By REGINALD ORTON, Surgeon of H. M. Thirty-fourth Regiment. Madras. 8vo. 1820. Second Edition, with a Supplement. London. 1831.

- A Treatise on the Epidemic Cholera of India. By JAMES BOYLE, Surg. of H. M. Ship Minden. 8vo. Lond. 1821.
- Sketches of the most prevalent Diseases of India, comprising a Treatise on the Epidemic Cholera of the East, &c. By JAMES ANNESLEY, Esq., Madras Medical Establishment, &c. 8vo. Lond. 1826. Sec. Ed. Lond. 1831.
- Notes on the Epidemic Cholera. By R. H. KENNEDY, M.D., &c., Surgeon, Bom. Pres. 8vo. Calcutta. 1827.
- Observations on the Nature and Treatment of Cholera. By A. T. CHRISTIE, M.D., Madras Medical Establishment, &c. 8vo. Edinb. 1828.
- Guide Sanitaire des Gouvernemens Européens, ou Nouvelles Recherches sur la Fièvre Jaune et le Choléra Morbus, &c. Par L. J. M. ROBERT, M.D., &c. 8vo. Paris. 1826.
- History of the Epidemic Spasmodic Cholera of Russia, &c. &c. By BISSET HAWKINS, M.D. &c. 8vo. Lond. 1831.
- Précis sur le Choléra Morbus, et sur la Contagion, &c. Par LAUR. BODIN, M.D. 8vo. Paris. 1831. Broch.
- Mémoire sur un Nouveau Traitement du Choléra Morbus, et des Affections Typhoides, &c. Par H. J. RANQUE, M.D. &c. Paris. 1831. 8vo. Broch.
- Cholera, its Nature, Cause, and Treatment, clearly and concisely explained. By CHARLES SEARLE, Esq., of the Hon. East India Company's Madras Establishment. 8vo. 1831. Second Edition, enlarged, with an Appendix. 1831.
- A Treatise on Cholera Asphyxia, or Epidemic Cholera, as it appeared in Asia and in Europe. By G. H. BELL, late Residency Surgeon, Tanjore, &c. Edinb. 1831.
- Letter to Sir Henry Halford, Bart., &c., on the Tendency of the proposed Regulations for Cholera, on the Nature of the Disease, &c. By G. H. BELL, &c. &c. Edinb. 1831.
- Remarks on the Cholera Morbus, its Symptoms, Causes, and Treatment, &c. By H. YOUNG, M.D., formerly of the Bengal Medical Establishment. 8vo. Lond. 1831.

- Practical Remarks on the Disease called Cholera, now existing on the Continent of Europe. By JOHN GOSS, late of the Bombay Med. Estab. 8vo. Lond. 1831.
- Observations on the Nature and Treatment of the Cholera Morbus, now prevailing epidemically in St. Petersburg. By G. W. LEFEVRE, M.D., Physician to the British Embassy, St. Petersburg, &c. 8vo. Lond. 1831.
- Observations on Cholera, comprising a Description of the Epidemic Cholera of India, the Mode of Treatment, and the Means of Prevention. By T. J. PETTIGREW, F.R.S., F.A.S., &c. 8vo. Lond. 1831.
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- Die Asiatische Cholera in Russland in den Jahren 1829 und 1830, &c. Nach Russischen aml. Quellen bearb. &c. Von D. I. R. LICHTENSTADT, Arzt. Professeur. Leipsic and Berlin. 1831. 8vo.
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The Numbers of the Medical Gazette during 1831, and particularly those for November.

The Lancet, for the 19th November, 1831.

The Medical and Surgical Journal for December, 1831.

CORRECTIONS.

Owing to the circumstance of the conclusions at which Drs. BARRY and RUSSELL had arrived respecting the infectious nature of this pestilence, as it appeared in Russia, not having been published in an accurate form, when the first sheets of the work went to press, the paragraph No. vi., page 62, in which errors had occurred, is here reprinted in a corrected state.

‘ vi. That the epidemic of St. Petersburg did not possess
 ‘ those absolute and indiscriminating communicable qualities
 ‘ attached to the plague and small-pox, and that the risk of
 ‘ infection incurred by the healthy, who approached the sick,
 ‘ was in direct proportion to the want of cleanliness, ventila-
 ‘ tion, and space around the latter.

Page 83, line 6, *for* “ the vital power,” *read* “ this power.”

The commencement of paragraph 170, page 128, should have been corrected as follows :—

(170.) Preferable to these, in my opinion, is the turpentine fomentation to the abdomen, already recommended (§ 162), inasmuch as it is more quick and decided in its operation than they usually are, &c.

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